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DEODORIZING TEXTILE TREATMENT AGENT

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**Abstract:** The invention relates to a conditioning agent having a deodorising action. Said conditioning agent contains a deodorising agent and 0.1 to 20 wt. % of a softening agent. The agent can be used for conditioning and deodorising objects and surfaces and forms a product in conjunction with a spray dispenser. The invention also relates to the use of the deodorising agents in methods for textile cleaning and stain treatment, in addition to the use thereof prior to a textile dry cleaning or textile drying process. The invention further relates to textile cleaning substrates containing deodorising agents, the use thereof in methods for textile conditioning, a textile cleaning kit containing at least one bag, a cleaning substrate and a sprayable product containing at least one deodorising agent.

The invention concerns a deodorizing agent for laundry conditioning, a product containing the agent and its use for deodorizing and/or conditioning an object or a surface. In addition, the invention concerns a textile cleaning process, a spot treatment process, a textile conditioning process, the use in a dry cleaning process and/or textile drying process and also as a cleaning substrate and a textile cleaning kit incorporating a deodorizing agent.

Since the beginning of the 1970s the zinc salt of ricinoleic acid has been known in the field of cosmetics to be a highly effective deodorizing agent for eliminating unpleasant odors or preventing their occurrence. By contrast, the zinc ricinoleates do not have bactericidal properties. In addition, ricinoleates of other metals and metal salts of related higher hydroxylated fatty acids and also of resin acids such as abietic acid, except for the alkali metal salts, have deodorizing properties, but do not achieve the efficacy of zinc ricinoleate.

The effect of zinc ricinoleate derives from the quenching of odor, i.e., chemical binding of the odoriferous substances, so that they are no longer sensorially perceptible, and in this way it differs in principle of action from other deodorizing systems like odor-covering perfumes or odor (odorant)-destroying biocides. According to current understanding, odorants, the so-called osmogens, for example low-molecular fatty acids, isovaleric acid, mercaptans, hydrogen sulfide, ammonia and thioethers, which as a rule are good nucleophils, are complexed by zinc ricinoleate and through this the sensory perception of them is taken away. Presumably, the hydroxyl group of the ricinoleic acid, which can make the ricinoleate anion available as a complexing ligand in addition to the carboxylate group, is important for the mechanism of action.

Most perfumes are based on less nucleophilic fragrances such as fragrances with aliphatic or aldehyde terpene systems and for this reason do not interact with zinc ricinoleate. In this way zinc ricinoleate enables deodorizing without undesired interferences with a perfume system that may be present.

DE 17 92 074 A (Grillo-Werke) from 1971 discloses for the first time an agent containing zinc ricinoleate as deodorizing agent, whose deodorizing effect is synergistically supported by the addition of salts, for example zinc salts, or esters of other saturated or unsaturated even-numbered or odd-numbered hydroxylated fatty acids with 17 or more C atoms, for example salts and esters of trihydroxystearic acids.

DE 254 48 344 A1 (Dart Industries) from 1976 discloses the deodorizing efficacy of metal salts of a hydrolyzed unsaturated fatty acid, especially metal ricinoleates. Metals from group II of the periodic system of elements and the rare earths like cerium, lanthanum or neodymium are preferred. Zinc ricinoleate is particularly emphasized.

EP 0 303 212 B1 (Grillo-Werke) discloses hydrolyzed ene adducts and Diels-Alder adducts of ricinonic fatty acids and maleic anhydride as deodorizing agents and as solubilizers for zinc ricinoleate.

DE 38 08 114 A1 (Grillo-Werke) discloses deodorizing active agent mixtures that contain zinc ricinoleate and optionally the zinc salt of abietic acid and/or other zinc salts of other saturated or unsaturated hydroxylated fatty acids with 17 or more C atoms, partial esters of di- or polyhydroxyalkanes, mono- and disaccharides, polyethylene glycols or alkanolamines with the ene adducts of maleic anhydride to at least monounsaturated carboxylic acids with a chain length of 10-25 carbon atoms and an acid number from 10 to 140, and optionally amino and/or amido compounds, and that are in fully dissolved form in preparations with water contents up to 50 wt%.

DE 40 14 055 C2 (Grillo-Werke) discloses deodorizing active agent mixtures that contain zinc ricinoleate and optionally the zinc salt of abietic acid and/or other zinc salts of other saturated or unsaturated hydroxylated fatty acids with 17 or more C atoms, an ethoxylated fatty alcohol with straight or branched alkyl chain and carbon counts between 10 and 18 with fewer than 30 ethylene oxide units per molecule and a tertiary amine and with which water-containing deodorants that have a water content up to 60 wt% can be prepared, for example clear pump spray solutions containing at least 32.3 wt% ethanol (96%) and no more than 60 wt% water and 2.2 wt% of a deodorizing active agent mixture of 50 wt% zinc ricinoleate, 35 wt% ethoxylated fatty alcohol and 15 wt% tertiary amine.

Like the zinc ricinoleates, cyclodextrins and their derivatives are also suitable for reducing unpleasant odors. However, their mechanism of action derives from the fact that the cyclodextrins can reversibly incorporate foreign molecules in their void spaces, with the formation of inclusion complexes. Cyclodextrins are less selective than the ricinoleates with regard to their absorption of molecules and for this reason also incorporate perfumes more easily into their void spaces.

WO 96/04940 (Procter & Gamble) discloses odor reducing aqueous compositions containing 0.01-1 wt% perfume and 0.1-5 wt% of a water-soluble cyclodextrin and optionally 0.1-10 wt% of a water-soluble metal salt. The compositions can be sprayed onto the objects whose odor is to be reduced.

WO 00/11134 discloses a conditioning agent for use in a dryer in the form of a sheet that has been impregnated with a conditioning agent containing 1-80 wt% of a softener, 50-99 wt% of a perfume-bearing cyclodextrin complex and at least 0.01 wt% of a color protection agent.

The conditioning agents known from the prior art, which exclusively contains cyclodextrin as odor absorbing agent, prove to be disadvantageous because of their reversible absorption of unpleasant odors. Upon coming into contact with water these unpleasant odors are released over a period of time and thus become a source of discomfort for the user. On top of that, agents that only contain cyclodextrin as the odor absorber do not lead to long-lasting absorption of odors. The term "long-lasting" is understood to mean that an object treated one

time with an odor absorber continues to repel or eradicate odors, in particular unpleasant odors, after the treatment.

The task of the invention now was to make available a laundry conditioning agent with excellent properties with regard to the deodorizing of textiles. The agent should additionally give the treated textiles long-lasting protection against unpleasant odors and also have good softening properties.

The object of the invention is thus in a first embodiment a laundry conditioning agent that contains at least one deodorizing substance and a softener.

The term "deodorizing effect" within the scope of the teaching in accordance with the invention is understood to mean the reduction or complete elimination of undesired odors.

Amounts or contents are, unless otherwise expressly noted, given in wt% with respect to the agent.

Substances that serve as ingredients of cosmetic agents are designated below, if applicable, in accordance with the International Nomenclature Cosmetic Ingredient (INCI) nomenclature. Chemical compounds have an INCI designation in the English language, plant ingredients are listed exclusively in accordance with Linnaeus in Latin, and trivial names like "water," "honey" or "sea salt" are likewise given in Latin. The INCI designations can be found in the International Cosmetic Ingredient Dictionary and Handbook—Seventh Edition (1997), which is published by The Cosmetic, Toiletry, and Fragrance Association (CTFA), 1101 17<sup>th</sup> Street, NW, Suite 300, Washington, DC 20036, USA and contains more than 9000 INCI designations and references to more than 37,000 trade names and industrial designations, including the pertinent distributors from more than 31 countries. The International Cosmetic Ingredient Dictionary and Handbook arranges the ingredients in one or more chemical classes, for example "Polymeric Ethers," and one or more functions, for example "Surfactants—Cleaning Agents," which again give explanations in greater detail and to which reference is made below, if applicable.

The conditioning agents in accordance with the invention contain as an essential component at least one deodorizing substance.

Deodorizing substances in the sense of the invention are all agents that can bind odorants like perfumes and/or unpleasant odors to themselves.

Preferred deodorizing substances in the sense of the invention are one or more metal salts of an unbranched or branched, unsaturated or saturated, mono- or polyhydroxylated fatty acid with at least 16 carbon atoms and/or a resin acid, with the exception of the alkali metal salts, and any mixtures of these.

A particularly preferred unbranched or branched, unsaturated or saturated, mono- or polyhydroxylated fatty acid with at least 16 carbon atoms is ricinoleic acid. A particularly preferred resin acid is abietic acid.

Preferred metals are the transition metals and the lanthanoids, especially the transition metals of groups VIIIa, Ib and IIb of the periodic system, as well as lanthanum, cerium and neodymium, especially preferably cobalt, nickel, copper and zinc, most preferably zinc. The cobalt, nickel and copper salts and the zinc salts have similar efficacy, but for toxicological reasons the zinc salts are to be preferred.

One or more metal salts of ricinoleic acid and/or abietic acid, preferably zinc ricinoleate and/or zinc abietate, especially zinc ricinoleate, are advantageously used and for this reason are especially preferred as deodorizing substances.

Likewise, any mixtures of the salts listed above with cyclodextrins have proved to be suitable deodorizing substances, preferably in a weight ratio from 1:10 to 10:1, especially preferably from 1:5 to 5:1 and in particular from 1:3 to 3:1. The term "cyclodextrin" here implies all of the known cyclodextrins, i.e., both unsubstituted cyclodextrins with 6-12 glucose units, especially alpha-, beta- and gamma-cyclodextrins and their mixtures, and/or their derivatives, and/or their mixtures.

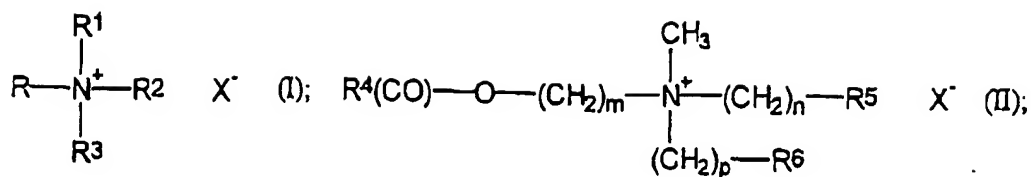
The conditioning agent in accordance with the invention contains one or more deodorizing substances in an amount of usually 0.1-10 wt%, preferably 0.1-5 wt%, especially 0.2-2 wt%, in each case with respect to the entire agent.

In choosing the amount of deodorizing agent component the relevant purpose of use is to be taken into consideration, since the amount necessary for a particular deodorizing effect is dependent on the type of odor to be eliminated. An appropriate amount can be determined in a simple application test.

The conditioners in accordance with the invention contain softeners as an additional important component.

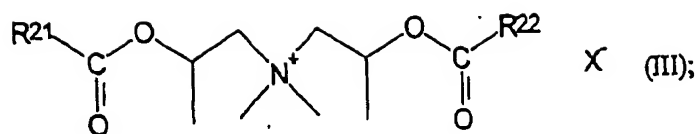
Examples of such compounds are quaternary ammonium compounds, cationic polymers and emulsifiers, such as are used in hair care agents and also in agents for textile finishing.

Suitable examples are quaternary ammonium compounds of formulas (I) and (II).



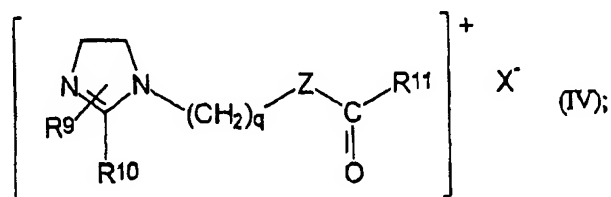
where in (I) R and R<sup>1</sup> stand for an acyclic alkyl residue with 12-24 carbon atoms, R<sup>2</sup> stands for a saturated C<sub>1</sub>-C<sub>4</sub> alkyl or hydroxyalkyl residue, R<sup>3</sup> is either equal to R, R<sup>1</sup> or R<sup>2</sup> or stands for an aromatic residue. X<sup>-</sup> stands either for a halide, methosulfate, methophosphate or phosphate ion or mixtures of these. Examples of cationic compounds of formula (I) are didecyldimethylammonium chloride, ditallowdimethylammonium chloride or dihexadecylammonium chloride.

Compounds of formula (II) are the so-called ester quats. Ester quats are characterized by excellent biodegradability. Here R<sup>4</sup> stands for an aliphatic alkyl residue with 12-22 carbon atoms with 0, 1, 2 or 3 double bonds; R<sup>5</sup> stands for H, OH or O(CO)R<sup>7</sup>, R<sup>6</sup>, independent of R<sup>5</sup>, stands for H, OH or O(CO)R<sup>8</sup>, where R<sup>7</sup> and R<sup>8</sup>, independent of one another, can in each case stand for an aliphatic alkyl residue with 12-22 carbon atoms with 0, 1, 2 or 3 double bonds. m, n and p can, in each case independent of one another, have the values 1, 2 or 3. X<sup>-</sup> can either be a halide, methosulfate, methophosphate or phosphate ion or mixtures of these. Compounds that contain the group O(CO)R<sup>7</sup> for R<sup>5</sup> and alkyl residues with 16-18 carbon atoms for R<sup>4</sup> and R<sup>7</sup> are preferred. Compounds in which R<sup>6</sup> in addition stands for OH are especially preferred. Examples of compounds of formula (II) are methyl-N-(2-hydroxyethyl)-N,N-di(tallowacyloxyethyl)ammonium methosulfate, bis(palmitoyl)ethylhydroxyethylmethylammonium methosulfate or methyl-N,N-bis(acyloxyethyl)-N-(2-hydroxyethyl)ammonium methosulfate. If quaternized compounds of formula (II) that have unsaturated alkyl chains are used, acyl groups whose corresponding fatty acid has an iodine number between 5 and 80, preferably between 10 and 60 and especially between 15 and 45 and that have a cis/trans isomer ratio (in wt%) greater than 30:70, preferably greater than 50:50 and especially greater than 70:30, are preferred. Commercially available examples are the methylhydroxyalkyldialkoyloxyalkylammonium methosulfates sold by Stepan under the trade name Stepanox® or the products from Cognis known as Dehyquat® or the products from Goldschmidt-Witco known as Rewoquat®. Other preferred compounds are the diester quats of formula (III), which are obtainable under the names Rewoquat® W 222 I.M or CR 3099 and provide for stability and color protection, in addition to softness.



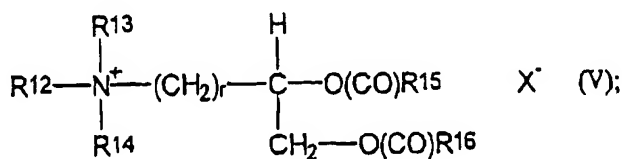
$\text{R}^{21}$  and  $\text{R}^{22}$  here, independent of one another, stand for an aliphatic residue with 12-22 carbon atoms with 0, 1, 2 or 3 double bonds.

Besides the quaternary compounds described above, it is also possible to use other known compounds such as quaternary imidazolinium compounds of formula (IV),



where  $\text{R}^9$  stands for H or a saturated alkyl residue with 1-4 carbon atoms,  $\text{R}^{10}$  and  $\text{R}^{11}$ , independent of one another, stand for an aliphatic, saturated or unsaturated alkyl residue with 12-18 carbon atoms. alternatively  $\text{R}^{10}$  can also stand for  $\text{O}(\text{CO})\text{R}^{20}$ , where  $\text{R}^{20}$  means an aliphatic, saturated or unsaturated alkyl residue with 12-18 carbon atoms, and Z means an NH group or oxygen, and  $\text{X}^-$  is an anion. q can take on integer values between 1 and 4.

Other suitable quaternary compounds are described by formula (V).



where  $\text{R}^{12}$ ,  $\text{R}^{13}$  and  $\text{R}^{14}$ , independent of one another, stand for a  $\text{C}_{1-4}$  alkyl, alkenyl or hydroxyalkyl group,  $\text{R}^{15}$  and  $\text{R}^{16}$ , in each case independently chosen, represent a  $\text{C}_{8-28}$  alkyl group, and r is a number between 0 and 5.



Besides the compounds of formulas (I) and (II), it is also possible to use short-chain water-soluble quaternary ammonium compounds like trihydroxyethylmethylammonium methosulfate, or the alkyltrimethylammonium chlorides, dialkyldimethylammonium chlorides trialkylmethylammonium chlorides, for example cetyltrimethylammonium chloride, stearyltrimethylammonium chloride, distearyldimethylammonium chloride, lauryldimethylammonium chloride, lauryldimethylbenzylammonium chloride and tricetylmethylammonium chloride.

Protonated alkylamine compounds that have softening action, as well as the unquaternized protonated precursors of the cationic emulsifiers, are also suitable.

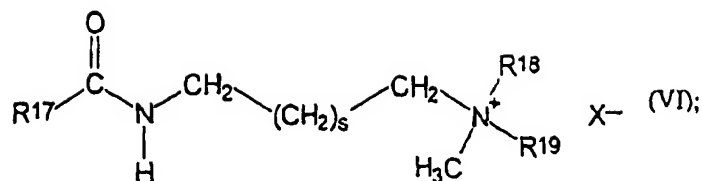
Other cationic compounds that can be used in accordance with the invention are the quaternized protein hydrolyzates.

Among the appropriate cationic polymers are the polyquaternium polymers, as are [found] in the CTFA Cosmetic Ingredient Dictionary (The Cosmetic, Toiletry and Fragrance [Association], Inc., 1997), especially the polyquaternium-6, polyquaternium-7, polyquaternium-10 polymers that are called merquats (Ucare Polymer IR 400; Amerchol), polyquaternium-4 copolymers like graft copolymers with a cellulose backbone and quaternary ammonium groups that are bonded via allyldimethylammonium chloride, cationic cellulose derivatives like cationic guar, guar hydroxypropyltrimonium chloride, and similar quaternized guar derivatives (for example Cosmedia Guar, Cognis GmbH), cationic quaternary sugar derivatives (cationic alkyl polyglucosides), for example the commercial product Glucquat® 100, according to CTFA nomenclature a "lauryl methyl gluceth-10 hydroxypropyl dimonium chloride," copolymers of PVP and dimethyl aminomethacrylate, copolymers of vinyl imidazole and vinylpyrrolidone, aminosilicone polymers and copolymers.

Polyquaternized polymers (for example Luviquat Care, BASF) and also cationic biopolymers based on chitin and its derivative, for example the polymer obtainable under the trade name Chitosan® (Cognis) are likewise usable.

Also suitable in accordance with the invention are cationic silicone oils such as, for example, the commercially available products Q2-7224 (Dow Corning; a stabilized trimethylsilylamodimethicone), Dow Corning 929 emulsion (containing a hydroxylamino-modified silicone, which is also called amodimethicone), SM-2059 (General Electric), SLM-55067 (Wacker), Abil®-Quat 3270 and 3272 (Goldschmidt-Rewo; diquaternary polydimethylsiloxanes, quaternium-80) and silicone quat Rewoquat® SQ 1 (Tegopren® 6922, Goldschmidt-Rewo).

Compounds of formula (VI) can also be used,



the alkylamidoamines can be in their unquaternized or, as shown, their quaternized form.  $\text{R}^{17}$  can be an aliphatic alkyl residue with 12-22 carbon atoms with 0, 1, 2 or 3 double bonds.  $s$  can take on values between 0 and 5.  $\text{R}^{18}$  and  $\text{R}^{19}$ , independent of one another, each stands for H,  $\text{C}_{1-4}$  alkyl or hydroxyalkyl. Preferred compounds are fatty acid amidoamines like the stearylamidopropyldimethylamine obtainable under the name Tego Amid® S 18 or the 3-tallowamidopropyltrimethylammonium methosulfate obtainable under the name Stepantex® X 9124, which are characterized by color transfer inhibiting properties and in particular by their good biodegradability, in addition to having a good conditioning action. Alkylated quaternary ammonium compounds in which at least one alkyl chain is interrupted by an ester group and/or amido group, especially N-methyl-N-(2-hydroxyethyl)-N,N-(ditallowacyloxyethyl)ammonium methosulfate, are particularly preferred.

Possibilities as nonionic softeners are, above all, polyoxyalkylene glycerol alkanooates, as are described in British Patent GB 2,202,244, polybutylenes, as described in British Patent GB 2,199,855, long chain fatty acids, as described in EP 13 780, ethoxylated fatty acid ethanolamides, as described in EP 43 547, alkyl polyglycosides, especially sorbitan mono-, di- and triesters, as described in EP 698 140, and fatty acid esters of polycarboxylic acids, as described in German Patent DE 2,822,891.

The laundry conditioning agents in accordance with the invention contain softeners in amounts from 0.1 to 80 wt%, usually 0.1-70 wt%, preferably 0.2-60 wt%, and especially 0.5-40 wt%, in each case with respect to the overall agent.

In a preferred embodiment the conditioning agents in accordance with the invention are in liquid form, advantageously in sprayable form. To achieve a liquid consistency, the use of both liquid organic solvents and also water may be indicated. For this reason the laundry conditioning agents in accordance with the invention optionally contain solvents.

Solvents that can be used in the agents in accordance with the invention derive, for example, from the group of mono- or polyhydric alcohols, alkanolamines or glycol ethers, provided they are miscible with water in the given concentration range. Preferably, the solvents are selected from ethanol, n- or isopropanol, butanols, glycol, propanediol or butanediol, glycerol, diglycol, propyl or butyl diglycol, hexylene glycol, ethylene glycol methyl ether,

ethylene glycol ethyl ether, ethylene glycol propyl ether, ethylene glycol mono-n-butyl ether, diethylene glycol methyl ether, diethylene glycol ethyl ether, propylene glycol methyl, ethyl or propyl ethers, butoxypropoxypropanol (BPP), dipropylene glycol monomethyl or monethyl ethers, diisopropylene glycol monomethyl or monoethyl ethers, methoxy-, ethoxy- or butoxy triglycol, 1-butoxyethoxy-2-propanol, 3-methyl-3-methoxybutanol, propylene glycol t-butyl ether and mixtures of these solvents.

Some glycol ethers are obtainable under the trade names Arcosolv® (Arco Chemical Co.) or Cellosolve®, Carbitol® or Propasol® (Union Carbide Corp.); these include, for example, ButylCarbitol®, HexylCarbitol®, MethylCarbitol®, and Carbitol® itself, [and] (2-(2-ethoxy)ethoxy)ethanol. The choice of the glycol ether can easily be made by the specialist on the basis of its volatility, water solubility, amount by weight in the overall dispersion and the like. Pyrrolidone solvents like N-alkylpyrrolidones, for example N-methyl-2-pyrrolidone or N-C<sub>8</sub>-C<sub>12</sub>-alkylpyrrolidone, or 2-pyrrolidone, can likewise be used. In addition, glycerol derivatives, in particular glycerol carbonate, are preferred as the only solvent or as a component of a solvent mixture.

Alcohols that can be used as cosolvents in this invention include liquid polyethylene glycols with low molecular weight, for example polyethylene glycols with a molecular weight of 200, 300, 400 or 600. Other suitable cosolvents are other alcohols, for example (a) lower alcohols like ethanol, propanol, isopropanol and n-butanol, (b) ketones like acetone and methyl ethyl ketone, (c) C<sub>2</sub>-C<sub>4</sub> polyols like a diol or triol, for example ethylene glycol, propylene glycol, glycerol or mixtures thereof. In the class of diols 1,2-octanediol is especially preferred.

Other organic solvents that are in principle suitable are traditional halogenated solvents, as are conventionally known from commercial dry cleaning. Among these are the di- to tetrachlorinated derivatives of methane, the di- to pentachlorinated derivatives of ethane, the mono- to trichlorinated derivatives of cyclohexane and monochlorobenzene, among others. Particular examples are tetrachlorocarbon, methylene chloride, 1,1-dichloroethane, 1,2-dichloroethane, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethene, 1,1,2,2-tetrachloroethane, tetrachloroethene, pentachloroethane, monochlorocyclohexane, 1,4-dichlorocyclohexane, monochlorobenzene and mixtures of these solvents. However, these chlorinated hydrocarbons are less preferred for use at home.

In one preferred embodiment the conditioning agent in accordance with the invention can contain one or more water-soluble organic solvents. "Water-soluble" is understood here to mean that the organic solvent is in the amount that is present soluble in an aqueous agent that may be present.

In one preferred embodiment the conditioning agent in accordance with the invention contains one or more solvents from the group that includes C<sub>1</sub>-C<sub>4</sub> monoalcohols, C<sub>2</sub>-C<sub>6</sub> glycols,

C<sub>3</sub>-C<sub>12</sub> glycol ethers and glycerol, especially ethanol. The C<sub>3</sub>-C<sub>12</sub> glycol ethers in accordance with the invention contain alkyl or alkenyl groups with fewer than 10 carbon atoms, preferably up to 8, especially up to 6, especially preferably 1-4 and most preferably 2-3 carbon atoms.

Preferred C<sub>1</sub>-C<sub>4</sub> monoalcohols are ethanol, n-propanol, isopropanol and tert-butanol. Preferred C<sub>2</sub>-C<sub>6</sub> glycols are ethylene glycol, 1,2-propylene glycol, 1,3-propylene glycol, 1,5-pentanediol, neopentyl glycol and 1,6-hexanediol, especially ethylene glycol and 1,2-propylene glycol. Preferred C<sub>3</sub>-C<sub>12</sub> glycol ethers are di-, tri-, tetra- and pentaethylene glycol, di-, tri- and tetrapropylene glycol, propylene glycol mono-tert-butyl ether and propylene glycol monoethyl ether as well as the solvents that have the INCI names butoxydiglycol, butoxyethanol, butoxyisopropanol, butoxypropanol, butyloctanol, ethoxydiglycol, ethoxyethanol, ethylhexanediol, isobutoxypropanol, isopentyldiol, 3-methoxybutanol, methoxyethanol, methoxyiso-propanol and methoxymethylbutanol.

Ethanol, 1,2-propylene glycol and dipropylene glycol and their mixtures, especially ethanol and isopropanol, are especially preferred solvents.

The agent in accordance with the invention contains one or more solvents in an amount of usually up to 40 wt%, preferably 0.1-30 wt%, especially 2-20 wt%, especially preferably 3-15 wt%, most preferably 5-12 wt%, for example, 5.3 or 10.6 wt%.

In a preferred embodiment the agent in accordance with the invention optionally contains water in an amount of more than 50 wt%, especially 60-95 wt%, especially preferably 70-93 wt% and most preferably 75-90 wt%.

In addition, the agents in accordance with the invention can optionally contain one or more anionic surfactants.

For example, surfactants of sulfonate and sulfate types are used as anionic surfactants. Possibilities as surfactants of sulfonate type are preferably C<sub>9-13</sub> alkylbenzene sulfonates, olefin sulfonates, i.e., mixtures of alkene and hydroxyalkane sulfonates as well as disulfonates, as are obtained, for example, from C<sub>12-18</sub> monoolefins with terminal or internal double bonds by sulfonation with gaseous sulfur trioxide followed by alkaline or acid hydrolysis of the sulfonation products. Also suitable are alkane sulfonates, which are obtained from C<sub>12-18</sub> alkanes, for example, by sulfochlorination or sulfoxidation followed by hydrolysis or neutralization. The esters of  $\alpha$ -sulfofatty acids (ester sulfonates), for example the  $\alpha$ -sulfonated methyl esters of hydrogenated coconut, palm kernel or tallow fatty acids, are also suitable.

Other suitable anionic surfactants are sulfonated fatty acid glycerol esters. Fatty acid glycerol esters are understood to mean the mono-, di- and triesters as well as their mixtures, as are obtained in industry by esterification of a monoglycerol with 1-3 mol fatty acid or in the transesterification of triglycerides with 0.3-2 mol glycerol. Preferred sulfonated fatty acid

glycerol esters are the sulfonation products of saturated fatty acids with 6-22 carbon atoms, for example caproic, caprylic, capric, myristic, lauric, palmitic, stearic or behenic acid.

The alkali and especially the sodium salts of the sulfuric acid semiesters of  $C_{12}$ - $C_{18}$  fatty alcohols, for example coconut fatty alcohol, tallow fatty alcohol, lauryl, myristyl, cetyl or stearyl alcohol or the  $C_{10}$ - $C_{20}$  oxo alcohols and the relevant semiesters of secondary alcohols of these chain lengths are preferred as alk(en)yl sulfates. Additionally preferred are alk(en)yl sulfates of the said chain length that contain a synthetic straight-chain alkyl residue produced by petrochemical means that has an analogous degradation behavior to the appropriate compounds that are made on the basis of fat chemistry raw materials. The  $C_{12}$ - $C_{16}$  alkyl sulfates and  $C_{17}$ - $C_{19}$  alkyl sulfates as well as  $C_{14}$ - $C_{15}$  alkyl sulfates are preferred for reasons of industrial laundry interest. Also, 2,3-alkyl sulfates, which can be produced, for example, in accordance with US Patents 3,234,258 or 5,075,041 and can be obtained as commercial products from the Shell Oil Company under the trade name DAN®, are suitable anionic surfactants.

The sulfuric acid monoesters of straight-chain or branched  $C_{7-21}$  alcohols ethoxylated with 1-6 mol ethylene oxide, such as 2-methyl-branched  $C_{9-11}$  alcohols with an average of 3.5 mol ethylene oxide (EO) or  $C_{12-18}$  fatty alcohols with 1-4 EO, are suitable. They are used in cleaning agents only in relatively small amounts, for example in amounts from 1 to 5 wt%, because of their high foaming behavior.

Other suitable anionic surfactants are the salts of an alkylsulfosuccinic acid, which are also called sulfosuccinates or sulfosuccinic acid esters and the monoesters and/or diesters of sulfosuccinic acid with alcohols, preferably fatty alcohols and especially ethoxylated fatty alcohols. Preferred sulfosuccinates contain  $C_{8-18}$  fatty alcohol residues or mixtures of them. Especially preferred sulfosuccinates contain a fatty alcohol residue that derives from ethoxylated fatty alcohols, which, considered by themselves, are nonionic surfactants. Here again sulfosuccinates whose fatty alcohol residues derive from ethoxylated fatty alcohols with narrow homolog distribution are especially preferred. It is also possible to use alk(en)ylsuccinic acid with preferably 8-18 carbon atoms in the alk(en)yl chain or their salts.

Possibilities as other anionic surfactants are in particular soaps. Saturated fatty acid soaps like the salts of lauric acid, myristic acid, palmitic acid, stearic acid, hydrogenated erucic acid and behenic acid and especially soap mixtures that derive from natural fatty acids, for example coconut, palm kernel or tallow fatty acids, are suitable.

The anionic surfactants, including the soaps, can be in the form of their sodium, potassium or ammonium salts and as soluble salts of organic bases like mono-, di- or triethanolamine. Preferably, the anionic surfactants are in the form of their sodium or potassium salts, especially in the form of the sodium salts.

Another class of anionic surfactants is the class of the ether carboxylic acids that can be obtained by the reaction of fatty alcohol ethoxylates with sodium chloroacetate in the presence of basic catalysts. They have the general formula:  $R^{10} O-(CH_2-CH_2-O)_p-CH_2-COOH$ , with  $R^{10} = C_1-C_{18}$  and  $p = 0.1-20$ . Ethercarboxylic acids are not sensitive to water hardness and have excellent surfactant properties. Their preparation and use are described, for example, in *Seifen, Öle, Fette, Wachse* 101, 37 (1975); 115, 235 (1989) and *Tenside Deterg.* 25, 308 (1988).

Other suitable anionic surfactants are, for example, the partial esters of di- or polyhydroxyalkanes, mono- and disaccharides, polyethylene glycols with the ene adducts of maleic anhydride to at least monounsaturated carboxylic acids with a chain length of 10-25 carbon atoms and an acid number of 10-140, which are described in DE 38 08 114 A1 (Grillo-Werke) and EP 0 046 070 A (Grillo-Werke), to which reference is made in this connection and the contents of which are hereby incorporated into this application.

Besides an unbranched or branched, saturated or unsaturated, aliphatic or aromatic, acyclic or cyclic, optionally alkoxyated alkyl residue with 4-28, preferably 6-20, especially 8-18, especially preferably 10-16, most preferably 12-14 carbon atoms, preferred anionic surfactants have two or more, especially two, anionic acid groups, preferably carboxylate, sulfonate and/or sulfate groups, especially a carboxylate and a sulfate group. Examples of these compounds are the  $\alpha$ -sulfofatty acid salts, acyl glutamates, monoglyceride disulfates and the alkyl esters of glycerol disulfate, and especially the monoesterified sulfosuccinates that are described below.

Particularly preferred anionic surfactants are the sulfosuccinates, sulfosuccinamates and sulfosuccinamides, especially sulfosuccinates and sulfosuccinamates, most preferably sulfosuccinates. The sulfosuccinates are salts of the mono- and diesters of sulfosuccinic acid  $HOOCH(SO_3H)CH_2COOH$ , while the sulfosuccinates are understood to be the salts of the monoamides of sulfosuccinic acid and the sulfosuccinamides are understood as the salts of the diamides of sulfosuccinic acid. An extensive description of these known anionic surfactants is given by A. Domsch and B. Irrgang in *Anionic Surfactants: Organic Chemistry* (edited by H. W. Stache; Surfactant Science Series; Volume 56; ISBN 0-8247-9394-3; Marcel Dekker, Inc., New York, 1996, pp. 501-549).

The salts are preferably alkali metal salts, ammonium salts and mono-, di- or trialkanolammonium salts, for example, mono-, di- or triethanolammonium salts, especially lithium, sodium, potassium or ammonium salts, especially preferably sodium or ammonium salts, most preferably sodium salts.

In the sulfosuccinates one or both carboxyl groups of the sulfosuccinic acid are esterified, preferably with one or two like or different, unbranched or branched, saturated or unsaturated, acyclic or cyclic, optionally alkoxyated alcohols with 4-22, preferably 6-20, especially 8-18,

especially preferably 16, most preferably 12-14 carbon atoms. Especially preferred are the esters of unbranched and/or saturated and/or acyclic and/or alkoxyated alcohols, especially unbranched, saturated fatty alcohols and/or unbranched, saturated fatty alcohols alkoxyated with ethylene and/or propylene oxide, preferably ethylene oxide, with a degree of alkoxylation of 1-20, preferably 1-15, especially 1-10, especially preferably 1-6, most preferably 1-4. The monoesters are preferred over the diesters within the scope of this invention. One particularly preferred sulfosuccinate is sulfosuccinic acid lauryl polyglycol ester disodium salt (lauryl EO sulfosuccinate, di-Na salt; INCI: disodium laureth sulfosuccinate), which is commercially available, for example, as Tego® Sulfosuccinat F 30 (Goldschmidt), with a sulfosuccinate content of 30 wt%.

In the sulfosuccinamates or sulfosuccinamides one or both carboxyl groups of the sulfosuccinic acid forms a carboxylic acid amide, preferably with a primary or secondary amine that preferably has one or two like or different, unbranched or branched, saturated or unsaturated, acyclic or cyclic, optionally alkoxyated alkyl residues with 4-22, preferably 6-20, especially 8-18, especially preferably 10-16, most preferably 12-14 carbon atoms. Unbranched and/or saturated and/or acyclic alkyl residues, especially unbranched saturated fatty alkyl residues are especially preferred.

Additionally suitable are, for example, the sulfosuccinates and sulfosuccinamates characterized by the INCI designation below, which are described in more detail in International Cosmetic Ingredient Dictionary and Handbook: ammonium dinonyl sulfosuccinate, ammonium lauryl sulfosuccinate, diammonium dimethicone copolyol sulfosuccinate, diammonium lauramido-MEA sulfosuccinate, diammonium lauryl sulfosuccinate, diammonium oleamido PEG-2 sulfosuccinate, diamyl sodium sulfosuccinate, dicapryl sodium sulfosuccinate, dicyclohexyl sodium sulfosuccinate, diheptyl sodium sulfosuccinate, dihexyl sodium sulfosuccinate, diisobutyl sodium sulfosuccinate, dioctyl sodium sulfosuccinate, disodium cetearyl sulfosuccinate, disodium cocamido MEA sulfosuccinate, disodium cocamido MIPA sulfosuccinate, disodium cocamido PEG-3 sulfosuccinate, disodium coco-glucoside sulfosuccinate, disodium cocoyl butyl gluceth-10 sulfosuccinate, disodium C12-15 pareth sulfosuccinate, disodium deceth-5 sulfosuccinate, disodium deceth-6 sulfosuccinate, disodium dihydroxyethyl sulfosuccinylundecylenate, disodium dimethicone copolyol sulfosuccinate, disodium hydrogenated cottonseed glyceride sulfosuccinate, disodium isodecyl sulfosuccinate, disodium isostearamido MEA sulfosuccinate, disodium isostearamido MIPA sulfosuccinate, disodium isostearyl sulfosuccinate, disodium laneth-5 sulfosuccinate, disodium lauramido MEA sulfosuccinate, disodium lauramido PEG-2 sulfosuccinate, disodium lauramido PEG-5 sulfosuccinate, disodium laureth-6 sulfosuccinate, disodium laureth-9 sulfosuccinate, disodium laureth-12 sulfosuccinate, disodium lauryl sulfosuccinate, disodium myristamido MEA

sulfosuccinate, disodium nonoxynol-10 sulfosuccinate, disodium oleamido MEA sulfosuccinate, disodium oleanido MIPA sulfosuccinate, disodium oleamido PEG-2 sulfosuccinate, disodium oleyl-3 sulfosuccinate, disodium oleyl sulfosuccinate, disodium palmitamido PEG-2 sulfosuccinate, disodium palmitolcamido PEG-2 sulfosuccinate, disodium PEG-4 cocamido MIPA sulfosuccinate, disodium PEG-5 lauryl citrate sulfosuccinate, disodium PEG-8 palm glycerides sulfosuccinate, disodium ricinoleamido MEA sulfosuccinate, disodium sitosterol-14 sulfosuccinate, disodium stearamido MEA sulfosuccinate, disodium stearyl sulfosuccinamate, disodium stearyl sulfosuccinate, disodium tallamido MEA sulfosuccinate, disodium tallowamido MEA sulfosuccinate, disodium tallow sulfosuccinamate, disodium tridecylsulfosuccinate, disodium undecylenamido MEA sulfosuccinate, disodium undecylenamido PEG-2 sulfosuccinate, disodium wheat germamido MEA sulfosuccinate, disodium wheat germamido PEG-2 sulfosuccinate, di-TEA oleamido PEG-2 sulfosuccinate, ditridecyl sodium sulfosuccinate, sodium bisglycol ricinosulfosuccinate, sodium/MEA laureth-2 sulfosuccinate and tetrasodium dicarboxyethyl stearyl sulfosuccinamate. Another suitable sulfosuccinamate is disodium-C<sub>16-18</sub>-alkoxypropylene sulfosuccinamate.

In a preferred embodiment the agent in accordance with the invention can contain one or more sulfosuccinates, sulfosuccinamates and/or sulfosuccinamides, preferably sulfosuccinates and/or sulfosuccinamates, especially sulfosuccinates, in an amount of usually 0.05-15 wt%, preferably 0.1-10 wt%, especially 0.3-6 wt%, especially preferably 0.5-3 wt%, most preferably 0.7-2 wt%, for example, 0.75 or 1.5 wt%.

The agents in accordance with the invention can optionally contain one or more nonionic surfactants as additional components.

Preferably alkoxylated, advantageously ethoxylated and/or propoxylated, especially primary alcohols with preferably 8-18 C atoms and an average of 1-12 mol ethylene oxide (EO) and/or 1-10 mol propylene oxide (PO) per mol of alcohol are used as nonionic surfactants. Especially preferred are C<sub>8</sub>-C<sub>16</sub> alcohol alkoxylates, advantageously ethoxylated and/or propoxylated C<sub>10</sub>-C<sub>15</sub> alcohol alkoxylates, especially C<sub>12</sub>-C<sub>14</sub> alcohol alkoxylates, with a degree of ethoxylation between 2 and 10, preferably between 3 and 8, and/or a degree of propoxylation between 1 and 6, preferably between 1.5 and 5. The alcohol residue can be preferably linear or, especially preferably, methyl-branched in position 2 or can contain linear or methyl-branched residues in a mixture, as usually is the case in oxo alcohol residues. However, alcohol ethoxylates with linear residues of alcohols of natural origin with 12-18 C atoms, for example, coconut, palm, tallow or oleyl alcohol, and an average of 2-8 EO per mol of alcohol are especially preferred. Among the preferred ethoxylated alcohols are, for example, C<sub>12-14</sub> alcohols with 3 EO or 4 EO, C<sub>9-11</sub> alcohol with 7 EO, C<sub>13-15</sub> alcohols with 3 EO, 5 EO, 7 EO or 8 EO.



C<sub>12-18</sub> alcohols with 3 EO, 5 EO or 7 EO and mixtures of these substances such as mixtures of C<sub>12-14</sub> alcohol with 3 EO and C<sub>12-18</sub> alcohol with 5 EO. The said degrees of ethoxylation and propoxylation are average values, which for a particular product can be a whole number or a fraction. Preferred alcohol ethoxylates and propoxylates have a narrow homolog distribution (narrow range ethoxylates/propoxylates, NRE/NRP). In addition to these nonionic surfactants, it is also possible to use fatty alcohols with more than 12 EO. Examples of these are tallow fatty alcohol with 14 EO, 25 EO, 30 EO or 40 EO, especially ones with a degree of ethoxylation up to 100 EO.

Also suitable are alkoxyated amines, advantageously ethoxylated and/or propoxylated, especially primary and secondary amines with preferably 1-18 C atoms per alkyl chain and an average of 1-12 mol ethylene oxide (EO) and/or 1-10 mol propylene oxide (PO) per mol of amine.

In addition, it is also possible to use, as other nonionic surfactants, alkyl glycosides of the general formula RO(G)<sub>x</sub>, for example as compounds, especially with anionic surfactants, in which R is a primary straight-chain or methyl-branched, especially methyl-branched in position 2, aliphatic residue with 8-22, preferably 12-18 atoms and G is a symbol that stands for a glucose unit with 5 or 6 C atoms, preferably glucose. The degree of oligomerization x, which gives the distribution of monoglycosides and oligoglycosides, is any number between 1 and 10; preferably x is 1.2-1.4.

Another class of preferably used nonionic surfactants, which can be used either as the only nonionic surfactant or in combination with other nonionic surfactants, are alkoxyated, preferably ethoxylated or ethoxylated and propoxylated fatty acid alkyl esters, preferably with 1-4 carbon atoms in the alkyl chain, in particular fatty acid methyl esters such as are described, for example, in Japanese Patent Application JP 58/217598 or which are preferably prepared by the method described in International Patent Application WO-A-90/13533.

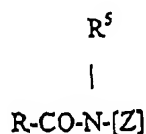
Nonionic surfactants of the type of the amine oxides, for example N-cocoalkyl-N,N-dimethylamine oxide and N-tallow alkyl-N,N-dihydroxyethylamine oxide, and the fatty acid alkanol amides can also be suitable.

Possibilities as other surfactants are the so-called gemini surfactants. These are in general understood to mean compounds that have two hydrophilic groups and two hydrophobic groups per molecule. As a rule, these groups are separated from each other by a "spacer." As a rule, this spacer is a carbon chain that should be long enough for the hydrophilic groups to have sufficient distance that they can act independently of one another. Such surfactants are in general characterized by an unusually low critical micelle concentration and the ability to reduce the surface tension of water significantly. However, in exceptional cases the term "gemini surfactants" is understood to mean not only dimer surfactants, but also trimer surfactants.

Suitable gemini surfactants are, for example, sulfated hydroxy mixed ethers in accordance with German Patent Application DE-A-43 21 022 or dimer alcohol bis- and trimer alcohol trissulfates and ether sulfates in accordance with International Patent Application WO-A-96/23768. End group-blocked dimer and trimer mixed ethers in accordance with German Patent Application DE-A-195 13 391 are characterized in particular by their bi- and multifunctionality. Thus, the said end group-blocked surfactants have good wetting properties and are thus low-foaming, so that they are particularly suitable for use in machine laundry or cleaning processes.

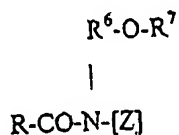
However, gemini polyhydroxy fatty acid amides or poly-polyhydroxy fatty acid amides, as described in International Patent Applications WO-A-95/19953, WO-A-95/19954 and WO-A-95/19955 can also be used.

Other suitable surfactants are polyhydroxy fatty acid amides of the following formula



in which RCO stands for an aliphatic acyl residue with 6-22 carbon atoms,  $R^5$  stands for hydrogen, an alkyl or hydroxyalkyl residue with 1-4 carbon atoms and [Z] stands for a linear or branched polyhydroxyalkyl residue with 3-10 carbon atoms and 3-10 hydroxy groups. The polyhydroxy fatty acid amides are known substances, which can usually be obtained by reductive amination of a reducing sugar with ammonia, an alkylamine or an alkanolamine followed by acylation with a fatty acid, fatty acid alkyl ester or fatty acid chloride.

The group of polyhydroxy fatty acid amides also includes compounds of the following formula



in which R stands for a linear or branched alkyl or alkenyl residue with 7-12 carbon atoms.  $R^6$  stands for a linear, branched or cyclic alkyl residue or an aryl residue with 2-8 carbon atoms and  $R^7$  stands for a linear, branched or cyclic alkyl residue or an aryl residue or an oxyalkyl residue

with 1-8 carbon atoms, where C<sub>1-4</sub> alkyl or phenyl residues are preferred, and [Z] stands for a linear polyhydroxyalkyl residue whose alkyl chain is substituted with at least two hydroxy groups, or alkoxyated, preferably ethoxyated or propoxyated, derivatives of this residue.

[Z] is preferably obtained by reductive amination of a reducing sugar, for example, glucose, fructose, maltose, lactose, galactose, mannose or xylose. The N-alkoxy- or N-aryloxy-substituted compounds can then be converted to the desired polyhydroxy fatty acid amides, for example in accordance with the teaching of International Application WO-A-95/07331, by the reaction of fatty acid methyl esters in the presence of an alkoxide as catalyst.

Preferred nonionic surfactants are unbranched or branched, saturated or unsaturated C<sub>10-22</sub> alcohols alkoxyated one or more times with ethylene oxide (EO) and/or propylene oxide (PO), with the degree of alkoxyation up to 30, preferably ethoxyated C<sub>10-18</sub> fatty alcohols with a degree of ethoxyation less than 30, preferably 1-20, especially 1-12, especially preferably 1-8, most preferably 2-5, for example C<sub>12-14</sub> fatty alcohol ethoxylates with 2, 3 or 4 EO or a mixture of C<sub>12-14</sub> fatty alcohol ethoxylates with 3 and 4 EO in a 1:1 ratio by weight or isotridecyl alcohol ethoxylate with 5, 8 or 12 EO, as are described, for example, in DE 40 14 055 C2 (Grillo-Werke), to which reference is made in this regard and the contents of which are hereby incorporated into this application.

The nonionic surfactants are, if applicable usually present in amounts up to 50 wt%, preferably from 0.1-40 wt%, especially preferably from 0.5-30 wt% and especially from 2-25 wt%, in each case with respect to the entire agent.

In addition, the agents in accordance with the invention can optionally contain amphoteric surfactants. Besides numerous monoalkylated up to trialkylated amine oxides the betaines are an important class of these amphoteric surfactants.

Betaines are known surfactants, which are chiefly prepared by carboxyalkylation, chiefly carboxymethylation of amine compounds. Preferably, the starting substances are condensed with halocarboxylic acids or their salts, in particular with sodium fluoroacetate, forming 1 mol of salt per mol of betaine. In addition, the addition of unsaturated carboxylic acids like acrylic acid is also possible. On the nomenclature and especially on the difference between betaines and "true" amphoteric surfactants, one should refer to the article by U. Ploog in *Seifen-Öle-Fette-Wachse*, 108, 373 (1982). Other surveys on this subject are those, for example, by A. O' Lennick et al. in *IIAPPI*, Nov. 70 (1986), S. Holzman et al. in *Tens. Surf. Det.* 23, 309 (1986), R. Bibo et al. in *Soap Cosm. Chem. Spec.*, Apr. 46 (1990) and P. Ellis et al. in *Euro Cosm.* 1, 14 (1994). Examples of suitable betaines are the carboxyalkylation products of secondary and especially tertiary amines that follow formula (I),



in which  $\text{R}^1$  stands for alkyl and/or alkenyl residues with 6-22 carbon atoms,  $\text{R}^2$  stands for hydrogen or alkyl residues with 1-4 carbon atoms,  $\text{R}^3$  stands for alkyl residues with 1-4 carbon atoms,  $n$  stands for numbers from 1-6 and  $\text{X}$  stands for an alkali and/or alkaline earth metal or ammonium. Typical examples are the carboxymethylation products of hexylmethanolamine, hexyldimethylamine, octyldimethylamine, decyldimethylamine, dodecylmethanolamine, dodecyldimethylamine, dodecylethylmethanolamine,  $\text{C}_{12/14}$  cocoalkyldimethylamine, myristyldimethylamine, cetyldimethylamine, stearyldimethylamine, stearylethylmethanolamine, oleyldimethylamine,  $\text{C}_{16/18}$ -tallow dimethylamine and their industrial mixtures.

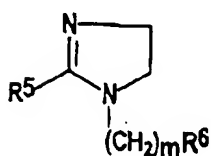
Other possibilities are carboxyalkylation products of amidoamines, which have the formula (II)



in which  $\text{R}^4\text{CO}$  stands for an aliphatic acyl residue with 6-22 carbon atoms and 0 or 1-3 double bonds,  $m$  stands for numbers from 1 to 3 and  $\text{R}^2$ ,  $\text{R}^3$ ,  $n$  and  $\text{X}$  have the meanings given above. Typical examples are the reaction products of fatty acids with 6-22 carbon atoms, specifically caproic acid, caprylic acid, capric acid, lauric acid, myristic acid, palmitic acid, palmoleic acid, stearic acid, isostearic acid, oleic acid, elaidic acid, petroselinic acid, linoleic acid, linolenic acid, elcostearic acid, arachic acid, gadoleic acid, behenic acid and erucic acid and their industrial mixtures, with  $\text{N,N}$ -dimethylaminoethylamine,  $\text{N,N}$ -dimethylaminopropylamine,  $\text{N,N}$ -diethylaminoethylamine and  $\text{N,N}$ -diethylaminopropylamine, which are condensed with sodium

chloroacetate. The use of a condensation product of  $C_{8/18}$  coco fatty acid N,N-dimethylaminopropylamide with sodium chloroacetate is preferred.

Other possibilities as suitable starting materials for the betaines to be used in the sense of the invention are also imidazolines, which follow formula (III).



(III)

in which  $R^5$  stands for an alkyl residue with 5-21 carbon atoms,  $R^6$  stands for a hydroxyl group, an  $OCOR^5$  or  $NHCOR^5$  residue and  $m$  stands for 2 or 3. These substances are also known substances, which can be obtained, for example, by ring-forming condensation of 1 or 2 mol fatty acid with polyvalent amines such as aminoethyl ethanolamine (AEEA) or diethylenetriamine. The corresponding carboxyalkylation products are mixtures of different open-chain betaines. Typical examples are condensation products of the fatty acids mentioned above, with AEEA, preferably imidazolines based on lauric acid or again  $C_{12/14}$  coco fatty acids, which are then betainized with sodium chloroacetate.

Further, the agent in accordance with the invention can contain one or more conventional auxiliary substances and additives, in particular from the group consisting of the builders, enzymes, bleaches, bleach activators, electrolytes, pH adjusters, complexing agents, fragrances, perfume vehicles, fluorescence agents, dyes, foam inhibitors, graying inhibitors, antiwrinkle agents, antimicrobial agents, germicides, fungicides, antioxidants, antistatic agents, ironing aids, UV absorbers, optical brighteners, antiredeposition agents, viscosity regulators, pearlescence agents, color transfer inhibitors, shrinkage preventers, corrosion inhibitors, preservatives, waterproofing and impregnation agents, hydrotropes, silicone oils and swelling agents and antislip agents.

In a preferred embodiment the agent in accordance with the invention can optionally additionally contain one or more complexing agents.

Complexing agents (INCI chelating agents), also called sequestering agents, are ingredients that are able to complex and inactivate metal ions in order to prevent their disadvantageous effects on the stability or the appearance of the agents, for example cloudiness. On the one hand it is important here to complex the calcium and magnesium water hardness ions

that are incompatible with many ingredients. The complexing of the ions of heavy metals like iron or copper prevents oxidative decomposition of the ready-to-use agents.

For example, the following complexing agents, which are listed by their INCI names, are suitable; they are described in more detail in the International Cosmetic Ingredient Dictionary and Handbook: aminotrimethylene phosphonic acid, beta-alanine diacetic acid, calcium disodium EDTA, citric acid, cyclodextrin, cyclohexanediamine tetraacetic acid, diammonium citrate, diammonium EDTA, diethylenetriamine pentamethylene phosphonic acid, dipotassium EDTA, disodium azacycloheptane diphosphonate, disodium EDTA, disodium pyrophosphate, EDTA, etidronic acid, galactaric acid, gluconic acid, glucuronic acid, HEDTA, hydroxypropyl cyclodextrin, methyl cyclodextrin, pentapotassium triphosphate, pentasodium aminotrimethylene phosphonate, pentasodium ethylenediamine tetramethylene phosphonate, pentasodium pentetate, pentasodium triphosphate, pentetic acid, phytic acid, potassium citrate, potassium EDTMP, potassium gluconate, potassium polyphosphate, potassium trisphosphonemethylamine oxide, ribonic acid, sodium chitosan methylene phosphonate, sodium citrate, sodium diethylenetriamine pentamethylene phosphonate, sodium dihydroxyethylglycinate, sodium EDTMP, sodium gluceptate, sodium gluconate, sodium glycereth-1 polyphosphate, sodium hexametaphosphate, sodium metaphosphate, sodium metasilicate, sodium phytate, sodium polydimethylglycinophenolsulfonate, sodium trimetaphosphate, TEA-EDTA, TEA-polyphosphate, tetrahydroxyethyl ethylenediamine, tetrahydroxypropyl ethylenediamine, tetrapotassium etidronate, tetrapotassium pyrophosphate, tetrasodium EDTA, tetrasodium etidronate, tetrasodium pyrophosphate, tripotassium EDTA, trisodium dicarboxymethyl alaninate, trisodium EDTA, trisodium HEDTA, trisodium NTA and trisodium phosphate.

Preferred complexing agents are tertiary amines, especially tertiary alkanolamines (amino alcohols). The alkanolamines have both amino and hydroxy and/or ether groups as functional groups. Especially preferred tertiary alkanolamines are triethanolamine and tetra-2-hydroxypropylethylenediamine (N,N,N',N'-tetrakis-(2-hydroxypropyl)ethylenediamine). Especially preferred combinations of amines with zinc ricinoleate and one or more ethoxylated fatty alcohols as nonionic solubilizers and optionally solvents are described in DE 40 14 055 C2 (Grillo-Werke), to which reference is made in this regard and whose contents are hereby incorporated in this application.

One particularly preferred complexing agent is etidronic acid (1-hydroxyethylidene-1,1-diphosphonic acid, 1-hydroxyethane-1,1-diphosphonic acid, HEDP, acetophosphonic acid, INCI: etidronic acid), including its salts. In one preferred embodiment the agent in accordance with the invention accordingly contains etidronic acid and/or one or more of its salts as complexing agent.

In a preferred embodiment the agent in accordance with the invention contains a complexing agent combination of one or more tertiary amines and one or more other complexing

agents, preferably one or more complexing agent acids or their salts, especially ones of triethanolamine and/or tetra-2-hydroxypropylethylenediamine and etidronic acid and/or one or more of its salts.

The agent in accordance with the invention contains complexing agents in an amount of usually 0-20 wt%, preferably 0.1-15 wt%, especially 0.5-10 wt%, especially preferably 1-8 wt%, most preferably 1.5-6 wt%, for example 1.5, 2.1, 3 or 4.2 wt%.

In another embodiment the agent optionally contains one or more viscosity regulators, which chiefly function as thickeners.

The viscosity of the agents can be measured with conventional standard methods (for example, Brookfield viscosimeter RVD-VII at 20 rpm and 20°C, spindle 3) and chiefly lies in the range from 10 to 5000 mPa·sec. Preferred liquid to gel agents have viscosities from 20 to 4000 mPa·sec, with values between 40 and 2000 mPa·sec being especially preferred.

Suitable thickeners are inorganic or polymer organic compounds. Mixtures of more than one thickener can also be used.

Among the inorganic thickeners are, for example, polysilicic acids, clay minerals like montmorillonite, zeolites, silicic acids, aluminosilicates, layer silicates and bentonites.

The organic thickeners derived from the group of the natural polymers, modified natural polymers and completely synthetic polymers.

Polymers deriving from nature that can be used as thickeners are, for example, xanthan, agar, carrageen, tragacanth, gum arabic, alginates, pectins, polyoses, guar flour, gellan gum, carob seed flour, starch, dextrans, gelatins and casein.

Modified natural substances come above all from the group of the modified starches and celluloses, for example carboxymethylcellulose and other cellulose ethers, hydroxyethyl and propylcellulose, highly etherified methylhydroxyethylcellulose and seed meal ethers may be mentioned here as examples.

A large group of thickeners that are widely used in quite various applications are the completely synthetic polymers like polyacrylic and polymethacrylic compounds, which can be crosslinked or uncrosslinked and optionally cationically modified, vinyl polymers, polycarboxylic acids, polyethers, activated polyamide derivatives, castor oil derivatives, polyimines, polyamides and polyurethanes. Examples of such polymers are acrylic resins, ethyl acrylate-acrylamide copolymers, acrylic acid ester-methacrylic acid ester copolymers, ethyl acrylate-acrylic acid-methacrylic acid copolymers, N-methylolmethacrylamide, maleic anhydride-methyl vinyl ether copolymers, polyether-polyol copolymers and butadiene-styrene copolymers.

Other appropriate thickeners are derivatives of organic acids, as well as their alkoxide adducts, for example aryl polyglycol ethers, carboxylated nonylphenol ethoxylate derivatives,

sodium alginate, diglycerol monoisostearate, nonionic ethylene oxide adducts, coco fatty acid diethanolamide, isododecenylsuccinic anhydride and galactomannan.

Thickeners from these classes of substances are commercially available and are offered, for example, under the trade names Acusol®-820 (methacrylic acid (stearyl alcohol 20 EO) ester-acrylic acid copolymer, 30% in water, Rohm & Haas), Dapral®-GT-282-S (alkyl polyglycol ether, Akzo), Deuterol®-Polymer-11 (dicarboxylic acid copolymer, Schöner GmbH), Deuteron®-XG (anionic heteropolysaccharide based on  $\beta$ -D-glucose, D-mannose, D-glucuronic acid, Schöner GmbH), Deuteron®-XN (nonionic polysaccharide, Schöner GmbH), Dicylan®-Verdicker [thickener]-O (ethylene oxide adduct, 50% in water/isopropanol, Pfersse Chemie), EMA®-81 and EMA®-91 (ethylene-maleic anhydride copolymer, Monsanto), Verdicker QR-1001 (polyurethane emulsion, 19-21% in water/diglycol ether, Rohm & Haas), Mirox®-AM (anionic acrylic acid-acrylic acid ester copolymer dispersion, 25% in water, Stockhausen), SER-AD-FX-1100 (hydrophobic urethane polymer, Servo Delden), Shellflo®-S (high molecular polysaccharide, formaldehyde-stabilized, Shell), Shellflo®-XA (xanthan biopolymer, formaldehyde-stabilized, Shell), Kelzan, Keltrol T (Kelco).

In another preferred embodiment the agent optionally contains one or more enzymes.

Possibilities as enzymes are in particular ones from the classes of the hydrolases like the proteases, esterases, lipases, or lipolytically active enzymes, amylases, cellulases or other glycosyl hydrolases and mixtures of the said enzymes. All of these hydrolases contribute to removal of spots like protein-, oil- or starch-containing spots and graying in the wash. Cellulases and other glycosylhydrolases can, moreover, contribute to maintenance of color and improving the softness of the textile through removing of pilling and microfibrils. Oxidoreductases can also be used for bleaching or to inhibit color transfer. Enzymatic active agents obtained from bacterial strains or fungi like *Bacillus subtilis*, *Bacillus licheniformis*, *Streptomyces griseus* and *Humicola insolens* are especially suitable. Proteases of subtilisin type are preferably used, especially proteases that are obtained from *Bacillus lentus*. Enzyme mixtures, especially ones of protease and amylase, or protease and lipase or lipolytically active enzymes, or protease and cellulase, or of cellulase and lipase or lipolytically active enzymes, or of protease, amylase and lipase or lipolytically active enzymes, or proteases, lipase or lipolytically active enzymes and cellulase, but especially protease and/or lipase-containing mixtures or mixtures with lipolytically active enzymes are of particular interest. Examples of such lipolytically active enzymes are the known cutinases. Peroxidases or oxidases have also proved to be suitable in certain cases. Among the suitable amylases are in particular  $\alpha$ -amylases, isoamylases, pullulanases and pectinases. Cellobiohydrolases, endoglucanases and  $\beta$ -glucosidases, which are also called cellobiases, or mixtures of these are preferably used as cellulases. Since different types of



cellulases differ in their CMCase and avicelase activities, the desired activities can be adjusted by selected mixtures of the cellulases.

The enzymes can be adsorbed on carrier substances as molded articles or can be embedded or coated in order to protect them against premature decomposition. The amount of the enzymes, enzyme mixtures or enzyme granulates can amount to, for example, approximately 0.1-5 wt%, preferably 0.12 to about 2 wt%.

The agents can optionally contain bleaches. Among the compounds that produce  $H_2O_2$  in water and serve as bleaches, sodium perborate, sodium perborate tetrahydrate and sodium perborate monohydrate are of particular importance. Other bleaches that may be used are, for example, peroxyphosphates, citrate perhydrates and  $H_2O_2$ -producing peracid salts or peracids like persulfates or persulfuric acid. Also usable is urea peroxohydrate percarbamide, which can be described by the formula  $H_2N-CO-NH_2 \cdot H_2O_2$ . In particular when the agents are used to clean hard surfaces, for example in machine dishwashing, they can also, if desired, contain bleaches from the group of the organic bleaches, although their use is in principle also possible with agents used for washing of textiles. Typical organic bleachers are the diacyl peroxides, for example dibenzoyl peroxide. Other typical organic bleaches are the peroxy acids, where alkyl peroxy acids and aryl peroxy acids may be mentioned in particular as examples. Preferred representatives are peroxybenzoic acid and its ring-substituted derivatives like alkyl peroxybenzoic acids, but also peroxy- $\alpha$ -naphthoic acid and magnesium monoperoxophthalate, the aliphatic or substituted aliphatic peroxy acids like peroxyauric acid, peroxysebacic acid,  $\epsilon$ -phthalimidoperoxycaproic acid (phthalimidoperoxylhexanoic acid, PAP),  $o$ -carboxybenzamidoperoxycaproic acid,  $N$ -nonenylamidoperoxadipic acid and  $N$ -nonenylamidopersuccinates, and aliphatic and araliphatic peroxydicarboxylic acids like 1,12-diperoxydicarboxylic acid, 1,9-diperoxyazelaic acid, diperoxysebacic acid, diperoxybrassylic acid, the diperoxyphthalic acids, 2-decyldiperoxybutane-1,4-dioic acid,  $N,N$ -terephthaloyldi(6-aminopercaproic acid).

The bleaches can be coated, in order to protect them against premature decomposition.

In a preferred embodiment the agent optionally contains one or more perfumes in an amount of usually up to 10 wt%, preferably 0.01-2 wt%, especially 0.05-1.5 wt%, especially preferably 0.2-1 wt%, in each case with respect to the overall agent. The perfume enhances the deodorizing effect of the agent in accordance with the invention in addition to—partial or complete—eradication of odor by the deodorizing agent, on the basis of its odor-covering action. Of advantage here is the indifference of the deodorizing active agent component in accordance with the invention, in particular zinc ricinoleate, with respect to most perfumes, so that neither does the deodorizing active agent bind the perfume and both components become mutually deactivated, nor is the perfume destroyed by the deodorizing active agents.

Individual odorant compounds can be used as perfume oils or fragrances, for example the synthetic products of the type of the esters, ethers, aldehydes, ketones, alcohols and hydrocarbons. Odorant compounds of ester type are, for example, benzyl acetate, phenoxyethyl isobutyrate, p-tert-butylcyclohexyl acetate, linalyl acetate, dimethyl benzyl carbinyl acetate, phenylethyl acetate, linalyl benzoate, benzyl formate, ethylmethylphenyl glycinate, allylcyclohexyl propionate, styrallyl propionate and benzyl salicylate. Among the ethers are, for example, benzyl ethyl ether, the aldehydes include, for example, the linear alkanals with 8-18 C atoms, citral, citronellal, citronellyloxyacetaldehyde, cyclamen aldehyde, hydroxycitronellal, linal and bourgeonal, while the ketones include, for example, the ionones,  $\alpha$ -isomethyl ionone and methyl cedryl ketone, the alcohols include anethole, citronellol, eugenol, geraniol, linalool, phenylethyl alcohol and terpineol, and the hydrocarbons include mainly the terpenes like limonene and pinene. However, it is preferable to use mixtures of different odorants that together produce a pleasant odor note. Such perfume oils can also contain natural odorant mixtures, as are obtainable from plant sources, for example pine, citrus, jasmine, patchouli, rose or ylang ylang oil. Likewise suitable are nutmeg oil, sage oil, camomile oil, clove oil, melissa oil, peppermint oil, cinnamon leaf oil, linden oil, juniperberry oil, vetiver oil, olibanum oil, galbanum oil and labdanum oil, as well as orange petal oil, neroliol, orange peel oil and sandalwood oil.

In a preferred embodiment the perfumes or fragrances are encapsulated in the form of microcapsules and/or nanocapsules. Advantageously, the surface of the capsules has an at least partial cationic charge, which exhibits good substantivity to the textiles to be conditioned, in particular wool and cotton, so that they remain on the corresponding textile even after the conditioning. The mechanism of release can be through pressure such as rubbing, etc., or through heat, as occurs in the dryer or in ironing. The capsules usually have a particle size in the nanometer to micrometer range, preferably from 10 nm to 1000  $\mu\text{m}$  and especially from 100 to 1000  $\mu\text{m}$ . Capsules in the nanometer range preferably have a size such that they are barely or not at all perceptible by the user. Microcapsules, especially ones with a particle size from 100 to 1000  $\mu\text{m}$ , can preferably be incorporated into the agents in accordance with the invention.

The capsules can be formed of a wall material and a core material, where the core material contains an encapsulated fragrance. However, the capsules can also be compact; in other words the core does not contain an active component, and thus is a hollow object, where in this case the capsule material (wall material) contains a fragrance or consists of a fragrance.

The preferred positive charge on the surface of the capsules can either be based in the capsule material itself or can be applied subsequently. For example, the capsule material can consist partially or entirely of a cationic polymer and/or the capsule material can be coated with cationic compounds. Coating with cationic compounds can take place in a simple way, for

example by spraying solutions or suspensions of compounds or immersing the capsules in solutions or suspensions of these compounds.

The capsule material of the microcapsules and/or nanocapsules, also called the wall material in what follows, can be any material that is suitable for production of such capsules; for example, it can consist of natural or synthetic polymers. Examples of such polymers are polymer polysaccharides like agarose or cellulose, chitin, chitosan, proteins like gelatins, gum arabic, ethylcellulose, methylcellulose, carboxymethylcellulose, hydroxyethylcellulose, cellulose acetates, polyamides, polycyanoacrylates, polylactides, polyglycolides, polyaniline, polypyrrole, polyvinylpyrrolidone, polystyrene, polyvinyl alcohol, copolymers of polystyrene and maleic anhydride, epoxy resins, polyethyleneimines, copolymers of styrene and methyl methacrylate, polyacrylates and polymethacrylates, polycarbonates, polyesters, silicones, mixtures of gelatins and water glass, gelatins and polyphosphate, cellulose acetate and phthalate, gelatins and copolymers of maleic anhydride and methyl vinyl ether, cellulose acetate butyrate and any mixtures of the said substances that can have cationic groups.

The wall material can optionally be crosslinked. The usual crosslinkers are glutaraldehyde, urea/formaldehyde resin, tannin compounds like tannic acid, and their mixtures.

The wall material should have strength and thermal stability such that the capsules are not destroyed under storage conditions, but that mechanical release of the encapsulated substances under the effect of light pressure or release by heat at temperatures from 35 to 220°C can occur.

Another release mechanism consists of the wall material being designed at least in part as a semipermeable membrane and the release of a gaseous core material takes place via the vapor pressure.

The release of the encapsulated ingredients can take place mechanically, i.e., by pressure. This pressure can occur, for example, in wearing the textiles or also, if the textiles are towels, when they are wetted. Release through an increase of temperature can occur, for example, in the dryer or during ironing, where the capsules melt or the encapsulated substances have an appropriately high vapor pressure and burst the capsules.

It is also possible to incorporate into the wall material photocatalytically active materials that slowly destroy the wall material under the effect of light, so that the encapsulated ingredients are released.

The production of the capsules takes place in a substantially known way, such as by phase separation methods, mechanical-physical methods or polymerization methods like suspension and emulsion polymerization, inverse suspension polymerization, micelle polymerization, interfacial polymerization methods, interfacial deposition, in situ polymerization, evaporation of solvents from emulsions, suspension crosslinking, formation of

hydrogels, crosslinking in solution/suspension, systems of liposomes and on a molecular scale, where phase separation methods, also called coacervation, are especially preferred.

Coacervation means that a dissolved polymer is converted to a polymer-rich phase that still contains solvents by means of desolvation, for example by a change of pH, temperature, salting out, change of ion strength, addition of complexing agents (complexing coacervation), addition of nonsolvents. The coacervate is deposited at the boundary of the material to be encapsulated while forming a cohesive capsule wall and is consolidated by drying or polymerization.

Physical methods for producing the microcapsules or nanocapsules in accordance with the invention are spray drying, fluidized bed methods, or extrusion methods (coextrusion), melt droplet formation or prilling (BRACE process) and spray freeze drying.

In the said interfacial polymerization methods wall formation takes place by polycondensation or polyaddition from monomer or oligomer starting materials at the interface of a water/oil or oil/water emulsion.

If the wall material of the capsule does not already have the advantageous cationic charge, the capsules are coated with a cationic compound, or a cationic polymer. For this they are either sprayed with or immersed in a solution or suspension of this compound. Here it is also possible to use spray drying for example.

The cationic compounds with which the capsules can be coated can be any cationic compound, provided that it has the appropriate substantivity to the substrate that is being treated. Examples of such compounds are the cationic softeners that have already been mentioned, in particular quaternary ammonium compounds and cationic polymers.

In a preferred embodiment the agent optionally contains one or more encapsulated perfumes in the form of one or more nano- and/or microcapsules in an amount of usually up to 10 wt%, preferably 0.01-5 wt% and especially 0.1-3 wt%, in each case with respect to the overall agent.

Dyes can be used in the agent in accordance with the invention, with the amount of one or more dyes being chosen to be low enough that no visible residues remain after application of the agent. However, the agent in accordance with the invention is preferably free of dyes.

Since the deodorizing agents in accordance with the invention have only a little antimicrobial or preservative effect or none at all, as, for example, in the case of zinc ricinoleate, the agent in accordance with the invention can optionally contain one or more antimicrobial agents or preservatives in an amount of usually 0.0001-3 wt%, preferably 0.0001-2 wt%, especially 0.0002-1 wt%, especially preferably 0.0002-0.2 wt%, most preferably 0.0003-0.1 wt%.

In each case according to antimicrobial spectrum and mechanism of action antimicrobial agents are distinguished as bacteriostatics and bactericides, fungistatics and fungicides, etc. Important substances from these groups are, for example, benzalkonium chlorides, alkylaryl sulfonates, halophenols and phenol mercury acetate [sic]. Within the scope of the teaching of the invention the terms antimicrobial action and antimicrobial agent have the meanings that are usual among specialists, which are given, for example, by K. H. Wallhäusser in *Practice of Sterilization, Disinfection—Preservation: Microbe identification—Plant Hygiene* (5<sup>th</sup> edition, Stuttgart; New York: Thieme, 1995), and all of the substances with antimicrobial action described there can be used. Suitable antimicrobial agents are preferably selected from the groups of the alcohols, amines, aldehydes, antimicrobial acids or their salts, carboxylic acid esters, acid amides, phenols, phenol derivatives, diphenyls, diphenylalkanes, urea derivatives, oxygen and nitrogen acetals and formals, benzamidines, isothiazolines, phthalimide derivatives, pyridine derivatives, antimicrobial surface-active compounds, guanidines, antimicrobial amphoteric compounds, quinolines, 1,2-dibromo-2,4-dicyanobutane, iodo-2-propylbutyl carbamate, iodine, iodophores, peroxo compounds, halogen compounds and any mixtures of these.

The antimicrobial agent can be chosen from ethanol, n-propanol, isopropanol, 1,3-butanediol, phenoxyethanol, 1,2-propylene glycol, glycerol, undecylenic acid, benzoic acid, salicylic acid, dihydroethanoic acid, o-phenylphenol, N-methylmorpholinoacetonitrile (MMA), 2-benzyl-4-chlorophenol, 2,2'-methylenebis(6-bromo-4-chlorophenol), 4,4'-dichloro-2'-hydroxydiphenyl ether (Dichlosan), 2,4,4'-trichloro-2'-hydroxydiphenyl ether (Trichlosan), chlorohexidine, N-(4-chlorophenyl)-N-(3,4-dichlorophenyl)urea, N,N'-(1,10-decanediyl-di-pyridinyl-4-ylidene)bis(1-octaneamine) dihydrochloride, N,N'-bis(4-chlorophenyl)-3,12-diimino-2,4,11,13-tetraazatetradecane diimideamide, glucoprotamines, antimicrobial surface-active quaternary compounds, guanidines, including the bi- and polyguanidines such as 1,6-bis(2-ethylhexylbiguanido)hexane dihydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-phenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane tetrahydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-phenyl-N<sub>1</sub>,N<sub>1</sub>'-methyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane dihydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-o-chlorophenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane hydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-2,6-dichlorophenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane hydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-beta-(p-methoxyphenyl)diguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane hydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-alpha-methyl-beta-phenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane hydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-p-nitrophenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane hydrochloride, omega:omega'-di(N<sub>1</sub>,N<sub>1</sub>'-phenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-di-n-propyl ether dihydrochloride, omega:omega'-di(N<sub>1</sub>,N<sub>1</sub>'-p-chlorophenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-di-n-propyl ether tetrahydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-2,4-dichlorophenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane tetrahydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-p-methylphenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane dihydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-2,4,5-trichlorophenyldiguanido-N<sub>5</sub>,N<sub>5</sub>')-hexane tetrahydrochloride, 1,6-di(N<sub>1</sub>,N<sub>1</sub>'-alpha-

(p-chlorophenyl)ethyldiguanido- $N_5, N_5'$ )hexane dihydrochloride, omega:omega-di( $N_1, N_1'$ -p-chlorophenyldiguanido- $N_5, N_5'$ )m-xylene dihydrochloride, 1,12-di( $N_1, N_1'$ -p-chlorophenyldiguanido- $N_5, N_5'$ )dodecane dihydrochloride, 1,10-di( $N_1, N_1'$ -phenyldiguanido- $N_5, N_5'$ )decane tetrahydrochloride, 1,12-di( $N_1, N_1'$ -phenyldiguanido- $N_5, N_5'$ )dodecane tetrahydrochloride, 1,6-di( $N_1, N_1'$ -o-chlorophenyldiguanido- $N_5, N_5'$ )hexane dihydrochloride, 1,6-di( $N_1, N_1'$ -o-chlorophenyldiguanido- $N_5, N_5'$ )hexane tetrahydrochloride, ethylenebis(1-tolylbiguanide), ethylenebis(p-tolylbiguanide), ethylenebis(3,5-dimethylphenylbiguanide), ethylenebis(p-tert-amylphenylbiguanide), ethylenebis(nonylphenylbiguanide), ethylenebis(phenylbiguanide), ethylenebis(N-butylphenylbiguanide), ethylenebis(2,5-diethoxyphenylbiguanide), ethylenebis(2,4-dimethylphenylbiguanide), ethylenebis(o-diphenylbiguanide), ethylenebis(mixed amyl naphthylbiguanide), N-butylethylenebis(phenylbiguanide), trimethylene bis(o-tolylbiguanide), N-butyltrimethylenebis(phenylbiguanide) and the corresponding salts like acetates, gluconates, hydrochlorides, hydrobromides, citrates, bisulfites, fluorides, polymaleates, N-coconutyl sarcosinates, phosphites, hypophosphites, perfluorooctanoates, silicates, sorbates, salicylates, malates, tartrates, fumarates, ethylenediamine tetraacetates, iminodiacetates, cinnamates, thiocyanates, arginates, pyromellitates, tetracarboxybutyrates, benzoates, glutarates, monofluorophosphates, perfluoropropionates and any mixtures of these. Also suitable are halogenated xylene and cresol derivatives like p-chloro-metacresol or p-chloro-metaxylene, as well as natural antimicrobial agents of plant origin (for example from roots or leaves), of animal or microbial origin. Preferably antimicrobial surface-active quaternary compounds, a natural antimicrobial agent of plant origin and/or a natural antimicrobial agent of animal origin, most preferably at least one natural antimicrobial agent of plant origin from the group consisting of caffeine, theobromine and theophylline as well as essential oils like eugenol, thymol and geraniol, and/or at least one natural antimicrobial agent of animal origin from the group consisting of enzymes like milk protein, lysozyme and lactoperoxidase, and/or at least one antimicrobial surface-active quaternary compound with an ammonium, sulfonium, phosphonium, iodonium or arsonium group, peroxy compounds and chlorine compounds can be used. Also, substances of microbial origin, the so-called bacteriocins can be used. Preferably, glycine, glycine derivatives, formaldehyde, compounds that readily give off formaldehyde, formic acid and peroxides are used.

The quaternary ammonium compounds (QACs) that are suitable as antimicrobial agents have the general formula  $(R^1)(R^2)(R^3)(R^4)N^+X^-$ , in which  $R^1-R^4$  can be like or different  $C_1-C_{22}$  alkyl residues,  $C_7-C_{28}$  aralkyl residues or heterocyclic residues, where two, or in the case of an aromatic single bond as in pyridine, even three residues together with the nitrogen form the heterocycle, for example a pyridinium or imidazolinium compound, and  $X^-$  represents halide

ions, sulfate ions, hydroxide ions or similar ions. For an optimum antimicrobial effect preferably at least one of the residues has a chain length of 8-18 C, especially 12-16, C atoms.

QACs can be produced by reacting tertiary amines with alkylation agents, for example methyl chloride, benzyl chloride, dimethyl sulfate, dodecyl bromide, or also ethylene oxide. The alkylation of tertiary amines with a long alkyl residue and two methyl groups takes place particularly easily, and the quaternization of tertiary amines with two long residues and a methyl group can also be carried out under mild conditions with the aid of methyl chloride. Amines that have three long alkyl residues or hydroxy-substituted alkyl residues available are less reactive and are preferably quaternized with dimethyl sulfate.

Suitable QACs are, for example, benzalkonium chloride (N-alkyl-N,N-dimethylbenzylammonium chloride, CAS No. 8001-54-5), Benzalkon B (m,p-dichlorobenzyl dimethyl-C<sub>12</sub>-alkylammonium chloride, CAS No. 58390-78-6), benzoxonium chloride (benzyl dodecyl bis(2-hydroxyethyl) ammonium chloride), cetyltrimonium bromide (N-hexadecyl-N,N-trimethylammonium bromide, CAS No. 57-09-0), benzetonium chloride (N,N-dimethyl-N-[2-[2-[p-(1,1,3,3-tetramethylbutyl)]phenoxy]ethoxy]ethyl benzylammonium chloride, CAS No. 121-54-0), dialkyldimethylammonium chlorides like di-n-decyl dimethylammonium chloride (CAS No. 7173-51-5-5), didecyl dimethylammonium bromide (CAS No. 2390-68-3), dioctyl dimethylammonium chloride, 1-cetylpyridinium chloride (CAS No. 123-03-5) and thiazoline iodide (CAS No. 15764-48-1) and their mixtures. Particularly preferred QACs are the benzalkonium chlorides with C<sub>8</sub>-C<sub>18</sub> alkyl residues, especially C<sub>12</sub>-C<sub>14</sub> alkylbenzyl dimethylammonium chloride.

Benzalkonium halides and/or substituted benzalkonium halides are commercially available, for example, as Barquat® (Lonza), Marquat® (Mason), Variquat® (Witco/Sherax) and Hyamine® (Lonza), as well as Bardac® (Lonza). Other commercially available antimicrobial agents are N-(3-chlorallyl)hexaminium chloride like Dowiecide® and Dowiecil® (Dow), benzethonium chloride like Hyamine® 1622 (Rohm & Haas), methylbenzethonium chloride like Hyamine® 10X (Rohm & Haas), cetylpyridinium chloride like Cepacol chloride (Merrell Labs).

The agents can additionally optionally contain UV absorbers, which are absorbed on treated textiles and improve the light stability of the fibers and/or the light stability of the other components of the formulation. UV absorbers are understood to be organic substances (light filters) that are capable of absorbing ultraviolet radiation and reemitting the absorbed energy in the form of longer wave radiation, for example heat. Compounds that have these desirable properties are, for example, the compounds and derivatives of benzophenone with substituents in positions 2 and/or 4, which are effective by radiationless deactivation. Also suitable are substituted benzotriazoles, for example the water-soluble benzenesulfonic acid 3-(2H-benzotriazol-2-yl)-4-hydroxy-5-(methylpropyl) monosodium salt (Cibafast® H), acrylates

phenyl-substituted in position 3 (cinnamic acid derivatives), optionally with cyano groups in position 2, salicylates, organic Ni complexes and natural substances like umbelliferone and the endogenous urocanic acid. Biphenyl and especially stilbene derivatives such as are described in EP 0728749 A and are commercially available from Ciba as Tinosorb® FD and Tinosorb® FR are particularly important. UV-B absorbers that may be mentioned include 3-benzylidene camphor or 3-benzylidene norcamphor and their derivatives, for example, 3-(4-methylbenzylidene)camphor, as described in EP 0693471 B1; 4-aminobenzoic acid derivatives, preferably 4-(dimethylamino)benzoic acid 2-ethylhexyl ester, 4-(dimethylamino)benzoic acid 2-octyl ester and 4-(dimethylamino)benzoic acid amyl ester; esters of cinnamic acid, preferably 4-methoxycinnamic acid 2-ethylhexyl ester, 4-methoxycinnamic acid propyl ester, 4-methoxycinnamic acid isoamyl ester, 2-cyano-3,3-phenylcinnamic acid 2-ethylhexyl ester (octocrylene); esters of salicylic acid, preferably salicylic acid 2-ethylhexyl ester, salicylic acid 4-isopropylbenzyl ester, salicylic acid homomenthyl ester; derivatives of benzophenone, preferably 2-hydroxy-4-methoxybenzophenone, 2-hydroxy-4-methoxy-4'-methylbenzophenone, 2,2'-dihydroxy-4-methoxybenzophenone; esters of benzalmalonic acid, preferably 4-methoxybenzmalonic acid di-2-ethylhexyl ester; triazine derivatives, for example 2,4,6-trianilino-(p-carbo-2'-ethyl-1'-hexyloxy)-1,3,5-triazine and octyl triazone, as described in EP 0818450 A1 or dioctyl butamido triazone (Uvasorb® HEB); propane-1,3-diones, for example 1-(4-tert-butylphenyl)-3-(4'-methoxyphenyl)propane-1,3-dione; ketotricyclo(5.2.1.0)decane derivatives, as described in EP 0694521 B1. Also suitable are 2-phenylbenzimidazole-5-sulfonic acid and its alkali, alkaline earth, ammonium, alkylammonium, alkanolammonium and glucammonium salts; sulfonic acid derivatives of benzophenone, preferably 2-hydroxy-4-methoxybenzophenone-5-sulfonic acid and its salts; sulfonic acid derivatives of 3-benzylidene camphor such as 4-(2-oxo-3-bornylidene methyl)benzenesulfonic acid and 2-methyl-5-(2-oxo-3-bornylidene)sulfonic acid and their salts.

Possibilities as typical UV-A filters are especially derivatives of benzoyl methane such as, for example, 1-(4'-tert-butylphenyl)-3-(4'-methoxyphenyl)propane-1,3-dione, 4-tert-butyl-4'-methoxydibenzoylmethane (Parsol 1789); 1-phenyl-3-(4'-isopropylphenyl)propane-1,3-dione and enamine compounds, as described in DE 19712033 A1 (BASF). Of course, the UV-A and UV-B filters can also be used in mixtures. Besides the said soluble substances, insoluble light-protective pigments are also possibilities for this purpose, specifically finely divided, preferably nanoized metal oxides or salts. Examples of suitable metal oxides are in particular zinc oxide and titanium dioxide and, in addition to these, oxides of iron, zirconium, silicon, manganese, aluminum and cerium, as well as their mixtures. Silicates (talc), barium sulfate or zinc stearate can be used as salts. The oxides and salts are already being used in the form of pigments for skin care and skin protective emulsions and decorative cosmetics. The particles should have an



average particle size of less than 100 nm, preferably between 5 and 50 nm and especially between 15 and 30 nm. They can have a spherical shape, but particles that have an ellipsoidal shape or a shape that otherwise differs from spherical can also be used. The pigments can also be surface-treated, i.e., hydrophilized or hydrophobized. Typical examples are coated titanium dioxides such as titanium dioxide T 805 (Degussa) or Eusolex® T2000 (Merck). Possibilities as hydrophobic coating agents are above all silicones and in particular trialkoxyoctylsilane or simethicone. Micronized zinc oxide is preferably used. Other suitable UV light protective filters can be found in the survey by P. Finkel in SÖFW Journal 122, 543 (1996).

The UV absorbers are usually used in amounts from 0.01 wt% up to 5 wt%, preferably from 0.03 wt% to 1 wt%.

In addition, the agents can optionally contain ironing aids to improve the water absorption capacity, the rewettability of the treated textiles and to make ironing the treated textiles easier. For example, the formulations can contain silicone derivatives. They additionally improve the rinsing behavior of the detergent formulations through their foam-inhibiting properties. Preferred silicone derivatives are, for example, polydialkyl- or alkylarylsiloxanes, in which the alkyl groups have 1-5 C atoms and are partially or entirely fluorinated. Preferred silicones are polydimethylsiloxanes, which can optionally be derivatized and then are amino functional, or quaternized, or have Si-OH, Si-H and/or Si-Cl bonds. The viscosities of the preferred silicones lie in the range between 100 and 100,000 mPa·sec at 25°C, and the silicones can be used in amounts between 0.2 and 5 wt%, with respect to the overall agent.

The object of the invention in a second embodiment is the use of the conditioning agent in accordance with the invention, preferably applied by spraying, optionally of sprayable agents, for deodorizing and/or conditioning an object, as surface or a space, preferably textile fabrics, surfaces in the home, shoes, garbage containers, recycling containers, air, large household appliances, cat litter, pets, pet bedding, in particular articles of clothing, carpets and carpeting, curtains and drapes, upholstery, bed linens, tents, sleeping bags, car seats, carpeting and interior soft trim, counter surfaces, walls, floors and surfaces in the kitchen and bathroom.

Large household appliances include, for example, refrigerators, freezers, washing machines, dishwashers, clothes dryers, ovens and microwave ovens.

The agent in accordance with the invention is optionally sprayable and for this reason can be used in a spray dispenser.

A third object of the invention accordingly is a product consisting of a conditioning agent in accordance with the invention and a spray dispenser.

Preferably the spray dispenser is a manually operated spray dispenser, especially one selected from the group consisting of aerosol spray dispensers, self pressurizing spray dispensers, pump spray dispensers and trigger spray dispensers, especially pump spray dispensers and

trigger spray dispensers that have a container of transparent polyethylene or polyethylene terephthalate.

Spray dispensers are extensively described in WO 96/04940 (Procter & Gamble) and the US patents cited there, to which reference in this regard is made and all of whose contents are hereby incorporated into this application.

Deodorizing substances in the sense of this invention can also be used in a cleaning process for textiles, where it is advantageous when softeners that may be used, as described above, give the textiles an additional conditioning effect.

A fourth object of the invention is thus a method for cleaning textiles by using an agent containing at least one deodorizing substance and optionally softeners.

The embodiment of the agents used in the washing process can be taken from the preceding description, with the difference that the softeners can optionally be contained in the agents. In a preferred embodiment the cleaning process is an automatic washing process, for example a household washing machine or a manual washing process, but especially a dry cleaning process in a household clothes dryer or a commercial textile drying device. Preferably, the deodorizing agents are added during the rinse operation of the washing process.

To reduce or entirely eliminate unpleasant odors on textiles and in addition to provide long-lasting prevention of the absorption of unpleasant odors by textile fabrics, which come, for example, from a conventional washing process, the deodorizing substances in the sense of this invention can be applied to the textiles before a subsequent dry cleaning process and/or washing process and/or textile drying process.

A fifth object of the invention is thus the use of an agent containing at least one deodorizing substance, which optionally additionally contains softeners, for conditioning and/or deodorizing textiles before a subsequent dry cleaning process and/or textile drying process and/or washing process.

In a preferred embodiment the agent, whose form of embodiment can be taken from the preceding description, with the difference that the softeners can optionally be contained in the agents, can be applied to the dried and/or wet textiles in liquid form, especially preferably by spraying or rolling on.

A sixth object of the invention is a cleaning substrate that is impregnated and/or coated with an agent containing at least one deodorizing substance and optionally softeners.

The form of embodiment of the impregnation or coating agent can be learned from the preceding description, with the difference that the softeners can optionally be contained in the agent.

Cleaning substrates find use above in spot (pre)treatment and in dry cleaning processes. The substrate material consists preferably of porous flat sheets. They can consist of a fiber or

cellular flexible material that has sufficient thermal stability for use in the dryer and can hold the necessary amount of an impregnation or coating agent to clean substances effectively without significant running or bleeding out of the agent during storage taking place. These sheets include sheets of woven and nonwoven synthetic and natural fibers, felt, paper or foam, such as hydrophilic polyurethane foam.

Preferably traditional sheets of nonwoven material (nonwovens) are used here. Nonwovens in general are defined as adhesively bonded fiber products that have a mat or layered fiber structure, or ones that include fiber mats in which the fibers are distributed randomly or in a statistical arrangement. The fibers can be natural fibers like wool, silk, jute, hemp, cotton, flax, sisal or ramie; or synthetic fibers like rayon, cellulose esters, polyvinyl derivatives, polyolefins, polyamides or polyesters. In general any fiber diameter or titer is suitable for this invention. The nonwoven substances used here, because the random or statistical arrangement of fibers in the nonwoven material gives excellent strength in all directions, do not tend to tear or fall apart when they are used, for example, in an ordinary household clothes dryer. Examples of nonwoven substances that are suitable as substrates in this invention are known, for example, from WO 93/23603. Preferred porous and flat cleaning sheets consist of one or more fiber materials, especially cotton, refined cotton, polyamide, polyester or mixtures of these. Preferably, the cleaning substrates in sheet form have an area from 10 to 5000 cm<sup>2</sup>, preferably from 50 to 2000 cm<sup>2</sup>, especially from 100 to 1500 cm<sup>2</sup> and especially preferably from 200 to 1000 cm<sup>2</sup>. The grammage of the material is usually between 20 and 1000 g/m<sup>2</sup>, preferably from 30 to 500 g/m<sup>2</sup> and especially from 50 to 150 g/m<sup>2</sup>.

A sixth object of the invention is a method for spot treatment of a soiled textile, where the spotted/soiled textile is placed with the spotted site on an absorbent underlayment, an agent containing at least one deodorizing substance and optionally softeners are applied to the textile and optionally an additional textile cleaning agent is applied to the soiled side of the textile.

Within the scope of the invention the term spot (pre)treatment or soil (pre)treatment—both terms can be used synonymously—is understood to mean the general treatment of soil particles, undesirable components, byproducts and other less definable substances that come into contact with textiles. The user expects the spot or soil (pre)treatment to bring about the removal of, for example, dust, soil, perspiration and odorants that contain nicotine and that are contained in perspiration from the textile at least to a large extent, and also mustiness or perfume residues that have collected in the textile, and also the removal of visible small and large spots.

The term "textiles" includes not only clothing, but also other objects that in the past were usually chemically cleaned, including sheets and blankets, curtains, small carpets, cushion covers, towels, stuffed animals, and the like.

The spot (pre)treatment of textiles before a subsequent dry cleaning process in a commercial household clothes dryer is already known from the prior art. What is new in contrast is now the use of an agent that contains deodorizing substances and optionally softeners. The form of an embodiment of the agent can be taken from the previous description with the difference that the softeners can optionally be contained in the agent. All of the pretreatment agents or textile cleaning agents used in dry cleaning processes that are known up to now can be used as optional additions to the cleaning agents to be applied. Especially preferred here are liquid and sprayable water-based agents, which additionally contain an amount of organic solvents. The water content with respect to the overall agent is preferably less than 99 wt% and in particularly advantageous embodiments lies between 40 and 98 wt%, especially between 60 and 95 wt%, and advantageously between about 75 and 90 wt%, in each case according to the content of other components.

One preferred embodiment of the method in accordance with the invention is

a) the pretreated and cleaned textile is placed, optionally with other pretreated or unpretreated textiles and a cleaning substrate, in particular a cleaning substrate in accordance with the invention in a bag that is permeable to water vapor or largely impermeable to water vapor,

b) the bag with the textiles and the cleaning substrate is rolled back and forth in a clothes dryer, where the agent on the substrate comes into contact with the textiles,

c) the cleaned textiles are removed from the bag.

The bag material preferably contains polyamide, especially nylon, polyalkylene, especially polyethylene and/or polypropylene, as well as polyesters, especially polyethylene terephthalate, and any mixtures of these polymers.

An eighth object of the invention is a textile cleaning kit that contains one or more bags and one or more cleaning substrates, preferably cleaning substrates in accordance with the invention. In addition, the kit contains a liquid and sprayable agent containing at least one deodorizing substance, and optionally a product in accordance with the invention and optionally one or more absorbent underlayments for spot (pre)treatment.

A ninth object of the invention is a conditioning process for textiles through the use of one or more cleaning substrate(s) in accordance with the invention or mixtures of this or these substrates with one or more other textile cleaning substrates in a textile drying process or washing or cleaning process.

The cleaning substrate is added to the wet and/or dry textiles in a wet or dry state. Advantageously, the cleaning substrates are put together with the textiles that are soiled and/or that need to be freshened and/or that need to be deodorized into the drum of an automatic washing machine in order to take part in the washing process. Another preferred embodiment in

the sense of the textile conditioning process in accordance with the invention is the bringing together of one or more cleaning substrates in accordance with the invention or mixtures of one or more cleaning substrates with one or more textile cleaning substrates in accordance with the invention with textiles that need to be dried and/or need to be freshened and/or need to be deodorized in a textile drying device, preferably a household clothes dryer or a commercial textile drying device.

### Examples

Examples of conditioning agents in accordance with the invention are E1 and E2, a comparison formulation is V1, and their compositions are given in Table 1.

Table 1

Zusammensetzung in Gew.-% ①	E1	E2	V1
Zinkricinoleat, bezogen auf Aktivsubstanz <sup>[a]</sup> ②	0,5	1	---
Stepantex VL 90 A <sup>[b]</sup>	15,0	15,0	15,0
Isopropanol	1,7	1,7	1,7
MgCl <sub>2</sub> · 6 H <sub>2</sub> O	0,12	0,12	0,12
Verdicker ③	0,1	0,1	0,1
Parfüm ④	+	+	+
Farbstoff ⑤	+	+	+
Wasser, vollentsalzt ⑥	ad 100	ad 100	ad 100

⑦. <sup>[a]</sup> Zinkricinoleat wurde in Form des Handelsprodukts *Tego<sup>®</sup> Sorb Conc 50* (Goldschmidt) eingesetzt, das 50 Gew.-% Zinkricinoleat, 35 Gew.-% Dchydol LS 3 (Laureth-3) und 15 Gew.-% Neutrol TE (Tetra-2-hydroxypropylethylendiamin).

<sup>[b]</sup> N-Methyl-N(2-hydroxyethyl)-N,N-(ditalgacyloxyethyl)-ammonium-methosulfat ex Stepan

- Key:
- 1 Composition in wt%
  - 2 Zinc ricinoleate, with respect to active substance<sup>[a]</sup>
  - 3 Thickener
  - 4 Perfume
  - 5 Dye
  - 6 Water, demineralized
  - 7 <sup>[a]</sup> Zinc ricinoleate was used in the form of the commercial product Tego® Sorb Conc. 50 (Goldschmidt), which contains 50 wt% zinc ricinoleate, 35 wt% Dehydol LS 3 (laureth-3) and 15 wt% Neutrol TF (tetra-2-hydroxypropylethylenediamine).
  - <sup>[b]</sup> N-Methyl-N(2-hydroxyethyl)-N,N-(ditallow acyloxyethyl)ammonium methosulfate (Stepan)

#### Long-lasting eradication of tobacco odor

Terrycloth towels were washed at 60°C with a commercially available all-purpose detergent and then

- A) a dry wash with 10.29 g conditioning agent E1/kg,
- B) a dry wash with 10.29 g conditioning agent E2/kg, or
- C) a dry wash with 10.29 g comparison composition V1/kg

was carried out in the rinse cycle.

#### Example 1:

A vapor-impermeable plastic sack was put over a cubic wire cage that had an edge length of 50 cm. A lit cigarette was put into the wire cage. After the cigarette had burned down, the solid cigarette residues were removed from the cage and equal amounts of hand towels from laundry tests A and C were put into the cage for 5 min. The hand towels were then left in open air for 1 h so that a part of the unpleasant odor in the textile produced by the cigarette smoke could dissipate. The towels from laundry tests A and C were given to a test group of 12 testers for evaluation in a pairwise comparison. All 12 testers evaluated the towels of laundry A to have a clearly more pleasant smell.

#### Example 2:

The test was carried out by analogy with Example 1, except that the towels from laundry tests B and C were put into the cage for 10 min. The towels from washes B and C were likewise given to a test group of 12 testers for evaluation in a pairwise test. 11 of the 12 testers evaluated the towels from laundry test B as having a clearly more pleasant odor.

Table 2 gives other conditioning agents E3 to E6 in accordance with the invention.

Table 2

Zusammensetzung in Gew.-% (1)	E3	E4	E5	E6
Stepantex VA 90 <sup>(b)</sup>	10	20	30	10
MgCl <sub>2</sub> x 6 H <sub>2</sub> O	0,5	0,8	0,6	1,0
C <sub>16-18</sub> -Fettalkohol+50-EO (2)	0,5	5,0	3	1,0
Zinkricinoleat <sup>(a)</sup> (3)	0,02	4,0	1,0	0,5
Schichtsilicate (4)	---	1,0	---	---
Siliconöl (5)	---	---	5	---
Adalin <sup>(c)</sup> (6)	---	---	---	1,5
Parfüm (7)	+	+	+	+
Wasser (8)	ad 100	ad 100	ad 100	ad 100

(a) Zinkricinoleat wurde in Form des Handelsprodukts Tego® Sorb Conc 50 (Goldschmidt) eingesetzt, das 50 Gew.-% Zinkricinoleat, 35 Gew.-% Dehydrol LS 3 (Laureth-3) und 15 Gew.-% Neutrol TE (Tetra-2-hydroxypropylethylenediamin).

(b) N-Methyl-N(2-hydroxyethyl)-N,N-(ditalgacyloxyethyl)-ammonium-methosulfat ex Stepan

(c) Polyethylendispersion ex Cognis

- Key: 1 Composition in wt%  
 2 C<sub>16-18</sub> fatty alcohol + 50 EO  
 3 Zinc ricinoleate<sup>(a)</sup>  
 4 Layer silicates  
 5 Silicone oil  
 6 Adaline<sup>(c)</sup>  
 7 Perfume  
 8 Water  
 9

(a) Zinc ricinoleate was used in the form of the commercial product Tego® Sorb Conc. 50 (Goldschmidt), which contains 50 wt% zinc ricinoleate, 35 wt% Dehydrol LS 3 (laureth-3) and 15 wt% Neutrol TE (tetra-2-hydroxypropylethylenediamine).

(b) N-Methyl-N(2-hydroxyethyl)-N,N-(ditallow acyloxyethyl)ammonium methosulfate (Stepan)

(c) Polyethylene dispersion (Cognis)

Nonwoven cloths of refined cotton were impregnated with each of the conditioners E3 through E6 in order to produce cleaning substrates in accordance with the invention. In each case one nonwoven cloth was put into a household clothes dryer together with wet, malodorous textiles. After the textile drying cycle the textiles not only showed a less unpleasant odor, but additionally had a pleasant softness.

Table 3 represents other deodorizing formulations F1 through F3, which are both suitable for direct use in a rinse cycle in a washing process and can serve as immersion fluid for substrates in accordance with the invention.

Table 3

Zusammensetzung in Gew.-% ①	F1	F2	F3
C <sub>10-16</sub> -Alkylethersulfat ②	1,0	---	---
Lauryl-EO-sulfosuccinat ③	---	---	2
Na-diisooctylsulfosuccinat ④	---	0,8	---
C <sub>12-15</sub> -Fettalkohol + 3 EO ⑤	2	0,8	---
Dimethylaurylaminoxid ⑥	1,5	0,5	---
Diethylenglykolether ⑦	8,5	---	---
Tetraethylenglycolmono-phenylether ⑧	---	5	---
Ethanol	---	---	5,5 -- 20
Zn-Ricinoleat ⑨	2	1,8	5,0
Etidronsäure ⑩	---	---	3,4
2,4-Dichlorbenzylalkohol ⑪	0,02	2,0	---
Parfüm ⑫	+	+	+
Entschäumer ⑬	0,1	0,2	0,1
Wasser ⑭	ad 100	ad 100	ad 100

- Key:
- 1 Composition in wt%
  - 2 C<sub>10-16</sub> alkyl ether sulfate
  - 3 Lauryl EO sulfosuccinate
  - 4 Na diisooctyl sulfosuccinate
  - 5 C<sub>12-15</sub> fatty alcohol + 3 EO
  - 6 Dimethyl lauryl amine oxide
  - 7 Diethylene glycol ether
  - 8 Tetraethylene glycol monophenyl ether
  - 9 Zn ricinolate
  - 10 Etidronic acid
  - 11 2,4-Dichlorobenzyl alcohol
  - 12 Perfume
  - 13 Antifoaming agent
  - 14 Water



To produce cleaning substrates in accordance with the invention nonwoven cloths of refined cotton were impregnated with deodorizing agents F1 through F3. The cleaning substrates were used for spot treatment of dry clean only textiles, for example silk, in which the spotted textile was placed on an absorber material (commercial kitchen paper towel) and the spot was rubbed out by applying pressure with the cleaning substrate. Then the cleaning substrate together with the precleaned textile was put into a bage, the bage was then sealed and the bage and contents were put into a clothes dryer. After a drying time of 10-30 min the textiles were removed from the bage. The dry cleaned textiles showed a clearly more pleasant smell than before.

### Claims

1. An agent for laundry conditioning containing
  - a) at least one deodorizing substance and
  - b) 0.01-80 wt% of a softener.
2. An agent as in Claim 1, which is characterized by the fact that the deodorizing substance is selected from one or more metal salts of an unbranched or branched, unsaturated or saturated, mono- or polyhydroxylated fatty acid with at least 16 carbon atoms and/or a resin acid with the exception of the alkali metal salts, and from any mixtures of these salts with themselves and cyclodextrins.
3. An agent as in Claim 2, which is characterized by the fact that the deodorizing substance contains one or more metal salts of ricinoleic acid and/or abietic acid, preferably zinc ricinoleate and/or zinc abietate, especially zinc ricinoleate.
4. An agent as in one of the preceding claims, which is characterized by the fact that it contains the deodorizing substance in amounts from 0.1 to 10 wt%, preferably 0.16 to 5 wt% and especially 0.2 to 2 wt%, in each case with respect to the entire agent.
5. An agent as in one of the preceding claims, which is characterized by the fact that it contains as softener cationic surfactants, preferably alkylated quaternary ammonium compounds, of which at least one alkyl chain is interrupted by an ester group and/or amido group, especially N-methyl-N-(2-hydroxyethyl)-N,N-(ditallow acyloxyethyl)ammonium methosulfate.
6. An agent as in one of the preceding claims, which is characterized by the fact that it contains softeners in amounts from 0.1 to 70 wt%, preferably 0.2 to 60 wt% and especially 0.5 to 40 wt%, in each case with respect to the entire agent.
7. An agent as in one of the preceding claims, which is characterized by the fact that it is liquid and contains up to 40 wt% of one or more solvents, especially water-soluble solvents.
8. An agent as in one of the preceding claims, which is characterized by the fact that it contains one or more perfumes, preferably one or more encapsulated perfumes in the form of one

or more nano- and/or microcapsules in an amount of up to 10 wt%, preferably 0.01-5 wt% and especially 0.1-3 wt%.

9. The use of an agent as in one of Claims 1-8 for deodorizing and/or conditioning an object, a surface or a space, preferably textile fabrics, household surfaces, shoes, garbage containers, recycling containers, air, large household appliances, cat litter, pets, pet bedding, especially articles of clothing, carpets and carpeting, curtains and drapes, upholstery, bed linens, tents, sleeping bags, car seats, carpeting and interior soft trim, counter tops, walls, floors, kitchen and bath surfaces.

10. A method for cleaning textiles through the use of an agent containing at least one deodorizing substance and optionally softeners.

11. A method as in Claim 10, which is characterized by the fact that the deodorizing substance is selected from one or more metal salts of an unbranched or branched, unsaturated or saturated, mono- or polyhydroxylated fatty acid with at least 16 carbon atoms and/or a resin acid, with the exception of the alkali metal salts, and from any mixtures of these salts with themselves and cyclodextrins.

12. A method as in Claim 11, which is characterized by the fact that the deodorizing substance contains one or more metal salts of ricinoleic acid and/or abietic acid, preferably zinc ricinoleate and/or zinc abietate, especially zinc ricinoleate.

13. A method as in one of Claims 9-12, which is characterized by the fact that the deodorizing substance is contained in amounts from 0.1 to 10 wt%, preferably 0.2 to 5 wt% and especially 0.5 to 2 wt%, in each case with respect to the entire agent.

14. A method as in one of Claims 9-13, which is characterized by the fact that it contains as softener cationic surfactants, preferably alkylated quaternary ammonium compounds, of which at least one alkyl chain is interrupted by an ester group and/or amido group, especially N-methyl-N-(2-hydroxyethyl)-N,N-(ditallow acyloxyethyl)ammonium methosulfate, in amounts from 0.1 to 70 wt%, preferably 0.2 to 60 wt% and especially 0.5 to 40 wt%, in each case with respect to the entire agent.

15. A method as in one of Claims 9-14, which is characterized by the fact that the agent is liquid and contains up to 40 wt% of one or more solvents, especially water-soluble solvents.

16. A method as in one of Claims 9-15, which is characterized by the fact that it is an automatic washing process and/or a hand washing process, in particular it is a dry cleaning process, where the agent is preferably added during the rinse cycle of the washing process.

17. A method as in one of Claims 9-16, which is characterized by the fact that the agent contains one or more anionic surfactants, especially one or more sulfosuccinates, sulfosuccinamates and/or sulfosuccinamides.

18. A method as in one of Claims 9-17, which is characterized by the fact that the agent contains one or more nonionic surfactants, especially one or more alkoxyated C<sub>10-22</sub> alcohols.

19. The use of an agent for conditioning and/or deodorizing textiles before a subsequent dry cleaning process and/or textile drying process, which is characterized by the fact that the agent contains at least one deodorizing substance and optionally softeners.

20. A use as in Claim 19, which is characterized by the fact that the deodorizing substance is chosen from one or more metal salts of an unbranched or branched, unsaturated or saturated, mono- or polyhydroxylated fatty acid with at least 16 carbon atoms and/or a resin acid, with the exception of the alkali metal salts, and from any mixture of these salts with themselves and cyclodextrins.

21. A use as in Claim 20, which is characterized by the fact that the deodorizing substance contains one or more metal salts of ricinoleic acid and/or abietic acid, preferably zinc ricinolate and/or zinc abietate, especially zinc ricinoleate.

22. A use as in one of Claims 18-21, which is characterized by the fact that the deodorizing substance is contained in amounts from 0.1 to 10 wt%, preferably 0.2 to 5 wt% and especially 0.5 to 2 wt%, in each case with respect to the entire agent.

23. A use as in one of Claims 18-22, which is characterized by the fact that it contains as softener cationic surfactants, preferably alkylated quaternary ammonium compounds, of which at least one alkyl chain is interrupted by an ester group and/or amido group, especially N-methyl-N-(2-hydroxyethyl)-N,N-(ditallow acyloxyethyl)ammonium methosulfate, in amounts from 0.1 to 70 wt%, preferably 0.2 to 60 wt% and especially 0.5 to 40 wt%, in each case with respect to the entire agent.

24. A use as in one of Claims 18-23, which is characterized by the fact that the agent is liquid and contains up to 40 wt% of one or more solvents, especially water-soluble solvents.

25. A use as in Claim 24, which is characterized by the fact that the agent contains solvents selected from the C<sub>1</sub>-C<sub>4</sub> monoolcohols, C<sub>2</sub>-C<sub>6</sub> glycols, C<sub>3</sub>-C<sub>12</sub> glycol ethers, glycerol or any mixtures of these.

26. A use as in one of Claims 18-25, which is characterized by the fact that the agent is applied in liquid form, preferably by spraying or rolling on to the dry and/or wet textiles.

27. A cleaning substrate impregnated and/or coated with an agent containing at least one deodorizing substance and optionally softeners.

28. A cleaning substrate as in Claim 27, which is characterized by the fact that the deodorizing substance is chosen from one or more metal salts of an unbranched or branched, unsaturated or saturated, mono- or polyhydroxylated fatty acid with at least 16 carbon atoms and/or a resin acid, with the exception of the alkali metal salts, and from any mixture of these salts with themselves and cyclodextrins.

29. A cleaning substrate as in Claim 28, which is characterized by the fact that the deodorizing substance contains one or more metal salts of ricinoleic acid and/or abietic acid, preferably zinc ricinoleate and/or zinc abietate, especially zinc ricinoleate.

30. A cleaning substrate as in one of Claims 27-29, which is characterized by the fact that the deodorizing substance is contained in amounts from 0.1 to 10 wt%, preferably 0.2 to 5 wt% and especially 0.5 to 2 wt%, in each case with respect to the entire agent.

31. A cleaning substrate as in one of Claims 27-30, which is characterized by the fact that it contains as softener cationic surfactants, preferably alkylated quaternary ammonium compounds, of which at least one alkyl chain is interrupted by an ester group and/or amido group, especially N-methyl-N-(2-hydroxyethyl)-N,N-(ditallow acyloxyethyl)ammonium methosulfate, in amounts from 0.1 to 70 wt%, preferably 0.2 to 60 wt% and especially 0.5 to 40 wt%, in each case with respect to the entire agent.

32. A cleaning substrate as in one of Claims 27-31, which is characterized by the fact that the agent is liquid and contains up to 40 wt% of one or more solvents, especially water-soluble solvents.

33. A cleaning substrate as in Claims 32, which is characterized by the fact that the agent contains solvents selected from the  $C_1$ - $C_4$  monoalcohols,  $C_2$ - $C_6$  glycols,  $C_3$ - $C_{12}$  glycol ethers, glycerol or any mixtures of these.

34. A cleaning substrate as in one of Claims 27-33, which is characterized by the fact that the agent contains one or more anionic surfactants, especially one or more sulfosuccinates, sulfosuccinamates and/or sulfosuccinamides.

35. A cleaning substrate as in one or more of Claims 27-34, which is characterized by the fact that the agent contains one or more nonionic surfactants, especially one or more alkoxyated  $C_{10-22}$  alcohols.

36. A product containing an agent as in one of Claims 1-8 and a spray dispenser.

37. A method for spot treatment of a soiled textile, which is characterized by the fact that

a) the spotted textile with the spotted area is laid on an absorbent underlayment,  
b) an agent containing at least one deodorizing substance and optionally softeners is applied to the textile,

c) optionally, a textile cleaning agent is additionally applied to the soiled area.

38. A method as in Claim 37, which is characterized by the fact that

d) the pretreated and cleaning textile, optionally together with other pretreated or untreated textiles and a cleaning substrate, especially a cleaning substrate as in one of Claims 27-35, is put into a bag that is water vapor-permeable or largely water vapor-impermeable,

e) the bag with the textiles and the cleaning substrate is rolled back and forth in a clothes dryer, where the agent on the substrate comes into contact with the textiles.

f) the cleaned textiles are removed from the bag.

39. A textile cleaning kit containing

a) one or more bags

b) one or more cleaning substrates, preferably cleaning substrates as in one of Claims 27-

35

c) a sprayable agent, containing at least one deodorizing substance

d) optionally a product as in Claim 36

e) optionally one or more absorbent underlayments.

40. A textile conditioning process, which is characterized by the fact that one or more cleaning substrates as in one of Claims 27-35 or mixtures of such substrate(s) with one or more other textile cleaning substrates [is/are used] in a textile drying process or a washing or cleaning process.

41. A method as in Claim 40, which is characterized by the fact that the substrates are used with textiles that need to be dried and/or need to be freshened and/or need to be deodorized in a textile drying device, preferably a household clothes dryer or a commercial textile drying device.

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